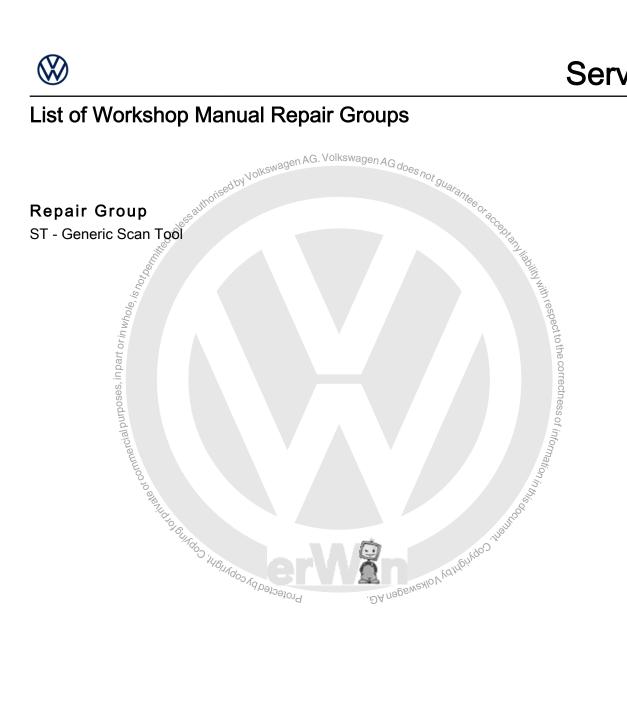






List of Workshop Manual Repair Groups



Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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ST -	- Gen	eric Scan Tool
	1	General Information
	1.1	Safety Precautions
	1.2	Clean Working Conditions
	2	Description and Operation
	2.1	On Board Diagnostic Systems
	2.2	Evaporative Emission System
	2.3	Electronic Throttle Control (ETC) System
	2.4	Electronic Power Control (EPC) Warning Lamp
	2.5	Engine Control Module (ECM)
	2.6	Malfunction Indicator Lamp (MIL)
	2.7	Controller Area Network (CAN)
	2.8	Fuel Supply
	2.9	Ignition and Timing
	2.10	Variable Valve Timing
	2.11	Exhaust-Gas Recirculation (EGR) System
	2.12	Secondary Air Injection
	2.13	Exhaust Systems
	2.14	SCR NOx Catalyst System
	3	Diagnosis and Testing
	3.1	Preliminary Check
		·
	3.3	Diagnostic Modes 0199 do
	3.4	Thomas DTC Tables
	3.4 3.51158	Transmission DTC Tables
	36	Diagnostic Procedures
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Generic Scan Tool

General Information

(Edition 09.2023)

Included in the contents of this Generic Scan Tool (GST) manual is a summary table of the vehicle specific OBD II Emission Related DTCs. The DTC table contains DTC Malfunction Criteria, Threshold Values, Secondary Parameters, Enabling Conditions, Monitoring Time Length, Frequency of Checks, and MIL Illumination information which can be used to accurately monitor and diagnose emissions related faults and perform functions required to run Modes 01 through 0A (if applicable) with a hand held scan tool.

This manual also contains the step by step procedures to accurately diagnose and repair a component or system once a DTC has been set. References to repair procedures and wiring diagrams can be found within the diagnostic test procedures.







1.1 Safety Precautions

Check for Technical Bulletins that may supersede any information included in this manual.





WARNING

Failure to follow these instructions may result in personal injury or possible death.

Check the Technical Bulletins for information, cautions and warnings that may supersede or supplement any information included in this manual.

When performing the drive cycle operation, pay strict attention to driving conditions and observe and obey all posted speed limits.

Test equipment must always be secured to the rear seat and operated by a second person. If test and measuring equipment is operated from the passenger seat, the person seated could be injured in the event of an accident involving deployment of the passenger-side airbag.

The fuel system is under pressure! Before opening the fuel system, place rags around the connection area. Then release pressure by carefully loosening the connection. AG does be seen to be a system of the fuel system of the fuel system.

The engine section of the fuel system, after the high pressure pump, is under extremely high pressure! When working on engine or fuel injection system, fuel pressure must be relieved to residual pressure before opening high pressure components. Refer to the Service Manual for the proper procedure.

If the battery has not been disconnected, the fuel pump fuse must be removed before opening the fuel supply system as the fuel pump may be activated by the driver's door contact switch.

Testing of the EVAP and ORVR systems can result in the escape of explosive fuel vapor. Do not smoke while testing the EVAP system, and make sure the area you are working in is well ventilated.

Observe the following for all procedures, especially in the engine compartment due to lack of room:

- Route lines of all types (e.g. for fuel, hydraulic, EVAP canister system, coolant and refrigerant, brake fluid, vacuum) and electrical wiring so that the original path is followed.
- Watch for sufficient clearance to all moving or hot components.
- Do not touch or disconnect the Ignition Coils, ignition wires, connecting parts or adapter cables when the ignition is on or the engine is running or turning at starting RPM.
- Only disconnect and reconnect wires for injection and ignition system, including test leads, when the ignition is turned off.

When removing and installing components from full or partially full fuel tanks, observe the following:

- ♦ The fuel tank must only be partially full. How much fuel can remain in the fuel tank may be read in the respective work description. Empty the fuel tank if necessary.
- Before starting work, switch on the exhaust extraction system and place an extraction hose close to the installation opening of the fuel tank to extract escaping fuel fumes. If no exhaust extraction system is available, a



radial fan (as long as motor is not in air flow) with a displacement greater than 15 m³/h can be used.

Prevent fuel from contacting the skin! Wear fuel-resistant gloves!

When servicing the engine control module (ECM), it may be necessary to use a heat gun. The heat gun, shear bolts, and parts of the protective housing will become extremely hot. Use extreme caution when working with or handling these parts to avoid personal injury.

Observe operating instructions when working with a heat gun. To prevent damage (burning) to the wiring and harness connections, insulation and the electronic components, perform outlined work steps exactly!

The cooling system is under pressure. To avoid scalding, use caution when opening the cooling system and servicing cooling system components!



Caution

The battery must only be disconnected and connected with the ignition switched off. Otherwise, the engine control module (ECM) can be damaged.

The use of nails, paper clips, or another unauthorized materials to back-probe harness connectors is strictly prohibited and may cause damage to the harness connectors, terminal ends or to a component. Use only the manufacturers test lead kit or an equivalent aftermarket test lead kit for back-probing all harness connectors.

Do not use sealants containing silicone. Particles of silicone drawn into the engine, will not be burned in the engine and will damage the oxygen sensors.

Secure all hose connections with the correct hose clips (the same as original equipment).

If engine is to be cranked without starting (for example; as part of a compression test), remove the fuses for the voltage supply of ignition coils and the fuel injectors.

An electrostatic charge can lead to functional problems of electrical components of the engine, transmission and selector lever mechanism. Touch a grounded object, e.g. a water pipe or a hoist, before working on electrical components.

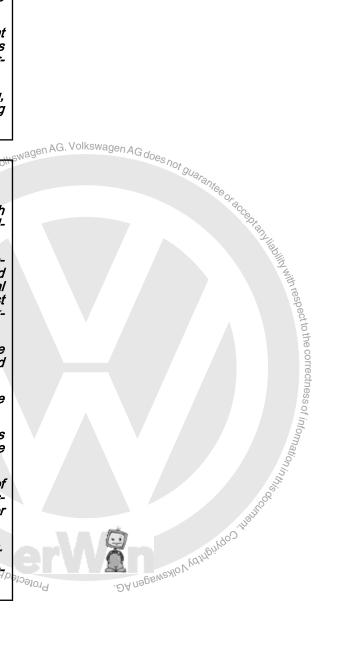
Do not make direct contact with harness connector terminals.

Use only gold-plated terminals when servicing any component with gold-plated harness connector terminals.

1.2 Clean Working Conditions

Even minor contaminations can lead to malfunctions in the fuel injection system. When working on the fuel supply/injection system, pay careful attention to the following rules of cleanliness:

- Thoroughly clean all connections and the surrounding area before disconnecting.
- Place removed parts on a clean surface and cover. Use lint-free cloths.
- Carefully cover opened components or seal, if repairs are not performed immediately.



- a system is open, do not work with compressed air.
 ..move vehicle unless absolutely necessary.

 all clean components: Remove the parts being replaced and AGA Volkswages.
 ..mediately prior to installation of the new parts. Do not use parts that have been stored unpacked (e.g. in ricol boxes etc.).

 Electrical connectors that have been disconnected: Protect from dirt and moisture. Make sure connections are clean and 'ry when reconnecting.



2 Description and Operation

- ♦ "2.1 On Board Diagnostic Systems", page 6
- ♦ ± "2.2 Evaporative Emission System", page 6
- ♦ ⇒ "2.3 Electronic Throttle Control (ETC) System", page 8
- ♦ "2.4 Electronic Power Control (EPC) Warning Lamp", page
 9
- ◆ ⇒ "2.5 Engine Control Module (ECM)", page 9
- ♦ ± "2.6 Malfunction Indicator Lamp (MIL)", page 9
- ♦ ± "2.7 Controller Area Network (CAN)", page 9
- ♦ ⇒ "2.8 Fuel Supply", page 10
- ♦ ⇒ "2.9 Ignition and Timing", page 11
- ♦ ± "2.10 Variable Valve Timing", page 12
- ♦ "2.11 Exhaust-Gas Recirculation (EGR) System", page
 12
- ♦ "2.12 Secondary Air Injection", page 12
- ♦ "2.13 Exhaust Systems", page 13
- ♦ ± "2.14 SCR NOx Catalyst System", page 13

2.1 On Board Diagnostic Systems

On Board Diagnostics, or OBD, is an automotive term referring to a vehicle's self-diagnostic and reporting capability. OBD systems give the vehicle owner or repair technician access to the status of the various vehicle sub-systems. Modern OBD implementations use a standardized digital communications port to provide real-time data in addition to a standardized series of Diagnostic Trouble Codes (DTCs) which allow one to rapidly identify and remedy malfunctions within the vehicle. Legislation mandates a vehicle equipped with OBD-II to light up the fault indicator lamp if its emissions exceed the prevailing limit due to system malfunction.

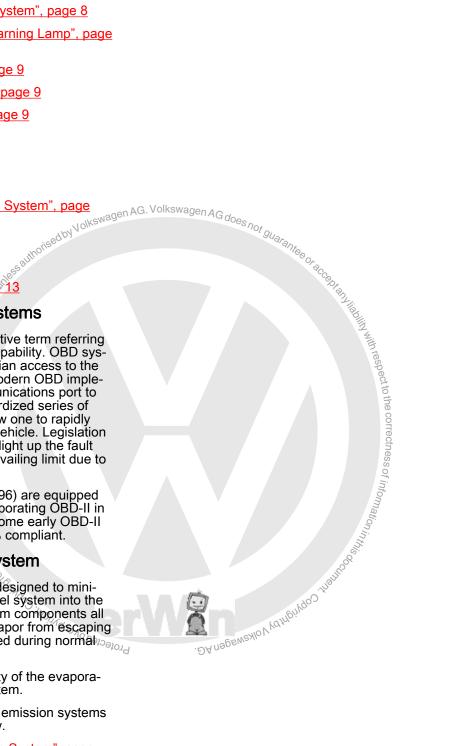
All cars built since January 1st, 1996 MY 1996) are equipped OBD-II systems. Manufacturers started incorporating OBD-II in various models as early as 1994; however, some early OBD-II cars (MY 1994 and MY 1995) were not 100% compliant.

2.2 Evaporative Emission System

The evaporative emission system has been designed to minimize the release of hydrocarbons from the fuel system into the atmosphere. The evaporative emission system components all work together with the ECM to prevent fuel vapor from escaping and route it to the intake manifold to be burned during normal combustion.

The leak detection system checks the integrity of the evaporative emission system by pressurizing the system.

- There are 3 different types of evaporative emission systems used. These systems are explained below.
- ♦ "2.2.1 Leak Detection Pump (LDP) Evap System", page
 7
- ♦ "2.2.2 Tank Leak Diagnostic Module (DM TL) Evap System", page 7
- ♦ "2.2.3 Natural Vacuum Leak Detection (NVLD) Evap System", page 7



♦ ⇒ "2.2.4 EVAP System, Checking for Leaks", page 7

2.2.1 Leak Detection Pump (LDP) Evap Sys-

The leak detection pump (LDP) is integrated into the EVAP system and can have two functions. The LDP can:

- Pressurize the EVAP system and detect a drop in pressure that would indicate a leak.
- Function as the EVAP Canister Vent on vehicles that do not have a separate EVAP Canister Vent.

The LDP is a vacuum-driven, ECM controlled, diaphragm pump. In order to operate, the engine must be running and vacuum applied to the Vacuum Switch.

2.2.2 Tank Leak Diagnostic Module (DM -TL) Evap System

The canister purge valve can be actively checked using the Tank Leak Diagnostic Module (DM - TL). For this purpose the electric pump is shortly activated while the combustion engine is running, to build up a minor pressure in the fuel tank and monitor the pressure decay after opening the canister purge valve. Optionally as a quick pass method, the monitoring can be carried out by passively monitoring the fuel mixture deviation when the canister purge valve is opened. If a significant fuel mixture deviation is detected, the purge valve monitor passes. The Tank Leak Diagnostic Module (DM - TL) consists of an electrically operated air pump, an orifice with a defined diameter serving as a reference leak, and a change-over valve switching the air flow between the reference leak and the tank. If neither the pump nor the change-over valve is activated, the tank is ventilated through a bypass in the module.

Natural Vacuum Leak Detection 2.2.3 (NVLD) Evap System

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System

System

See and line rout-The system utilizes an engine-off natural vacuum evaporative system integrity check that tests for leaks with a diameter of 0.020 inch while the engine is off and the ignition is off. The natural vacuum leak detection (NVLD) evaporative system integrity check uses a pressure switch to detect evaporative system leaks. The correlation between the pressure and the temperature in a sealed system is used to generate a vacuum in the tank when the temperature drops. If a sufficient temperature drop is detected for a minimum time period, the vacuum level in a sealed system will exceed the threshold to close the NVLD pressure switch. Therefore, if the switch does not close under these conditions, a leak is detected. If the switch closes, the system is considered to be leak-free.

2.2.4 EVAP System, Checking for Leaks

The following procedure is used to diagnose EVAP System leaks.

Special tools and workshop equipment required.

- Smoke tester.
- EVAP and Fuel Supply System Vacuum hose and line routing diagram.

Leak checking

Using a Smoke tester, check the Evaporative Emission (EVAP) canister system for leaks.

Always follow the manufacturers directions for the proper installation and operation of the smoke tester being used.

If a leak is detected:

- Check the fuel filler cap seal for damage and for proper installation. Replace if necessary.
- Check all hose connections of the fuel supply system and replace or repair any leaking lines.
- Check all hose connections of the EVAP system and replace or repair any leaking lines.
- Check that the seal under the locking flange is properly tightened on the fuel tank.
- Secure all hose connections using appropriate fittings for the model type.
- Replace seals and gaskets when performing repair work.
- Repair or replace any damaged component.

If no leaks are found in the EVAP system:

- Erase the DTC memory if a DTC was set. Refer to ⇒ .3.4 Diagnostic Mode 04 - Erase DTC Memory ", page
- Perform a road test to verify repair.

If a DTC was set and does not return:

Diagnosis complete. Generate readiness code. Refer to ≥ "3.2 Readiness Code", page 17

If the same DTC does return and no leaks are found in the **EVAP system:**

- Check for any related TSB's: AG. Volkswagen AG does no
- Perform the diagnostic test procedure for the suspected component.«

2.3 Electronic Throttle Control (ETC) Sys-

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ir system to the en deterning calcuselerator ehicle speed or less in ferent engine

Dane De Men Montal Manuel Man The electronic throttle control (ETC) system consists of the accelerator-pedal module, the engine control module (ECM), and the electronic throttle body. The electronic throttle body mainly consists of the throttle valve, the electric throttle-valve drive element, and the throttle-valve position sensor (TPS). The drive element is a DC servomotor, which acts on the throttle-valve shaft via a gear unit. The throttle-valve position sensor is a redundant sensor system that detects the position of the throttle valve. The sensors have opposite resistance curves so that the ECM can always cross check the signals to ensure the correct position of the throttle valve is always known.

The driver command is detected by a redundant sensor system in the accelerator-pedal module, and the signal is sent to the engine control module. The engine control module then determines the required throttle-valve position by performing calculations from data measured by sensors such as accelerator pedal position sensor, engine speed sensor and vehicle speed sensor. The actual throttle opening can be more or less in proportion to accelerator pedal position given different engine operating points. Protected by copyright, Co.



2.4 Electronic Power Control (EPC) Warning Lamp

When the ignition is switched on, the engine control module (ECM) checks the electronic throttle control system for static system integrity (e.g. circuit integrity, communications, etc); the electronic power control (EPC) warning light is turned on via the Instrument Cluster during this process. Shortly after engine start, the EPC warning light is turned off if no malfunction in the electronic throttle control system is detected. In the event of a malfunction while the engine is running, the ECM will activate the EPC warning light via the Instrument Cluster and at the same time, a Diagnostic Trouble Code (DTC) is stored in the ECM memory.

2.5 Engine Control Module (ECM)

The Engine Control Module (ECM) is a generic term for any embedded system that controls one or more of the electrical systems or subsystems in a vehicle. It controls a series of actuators on an internal combustion engine to ensure that driver commands (e.g. to accelerate) are translated into appropriate engine performance. It reads values from a multitude of sensors, interprets the data and adjusts the engine actuators accordingly. The ECM also interacts with the transmission control module (TCM), ABS/traction/stability control module and other vehicle function related control systems.

ECM controlled systems and functions (performance and emission related) will be introduced in the following chapters. These include the OBD system, controller area network (CAN), throttle control module, fuel supply, ignition, variable valve timing, exhaust-gas recirculation, secondary air injection, exhaust system, and EVAP system.

2.6 Malfunction Indicator Lamp (MIL)

When the ignition is switched on, the Engine Control Module (ECM) performs checks on static system integrity (e.g. circuit integrity, communications, etc). The Malfunction Indicator Lamp (MIL) is switched on during this process via the Instrument Cluster. After engine starts, the ECM examines engine operation for potential malfunction(s) or failure(s) that can lead to increased emission values. If no malfunction is detected, the ECM switches off the MIL via the Instrument Cluster.

In the event of a malfunction during the operation of the engine, the ECM will activate the MIL via the instrument cluster and at the same time, a Diagnostic Trouble Code (DTC) is stored in the ECM memory. In OBD systems, the MIL can have up to three stages: steady, flashing and Stop Vehicle. A steady MIL indicates a minor fault (e.g. a failing oxygen sensor) whereas a flashing MIL indicates a more severe malfunction that could result in damage of engine or exhaust system components (e.g. the catalytic converter) if left uncorrected for an extended period. This would also indicate a severe fault. The three stages are 1. ON, then OFF; 2. ON steady, 3. flashing constantly. The 3rd stage indicates damage may occur and driver must stop.

2.7 Controller Area Network (CAN)

Overview

The Controller Area Network (CAN) bus is a message-based protocol that allows control units and devices to communicate with each other using a shared network. With this system, control units of the various electronic systems are no longer interconnected by multiple separate cables. This does away with a large number of electrical connections and results in a reduced likelihood of failure of the device network.



Broadcast Communication

Each of the devices on the network has a CAN circuit and is therefore is considered "intelligent". All devices on the network see all transmitted messages. Each device can determine if a message is relevant or if it should be filtered out. This structure allows modifications to CAN networks with minimal impact. Additional non-transmitting nodes can be added without modification to the network.

Priority

Every message has an assigned priority. If two nodes try to send messages simultaneously, the one with the higher priority gets transmitted and the one with the lower priority gets postponed. This arbitration does not affect other messages and results in non-interrupted transmission of the highest priority message

2.8 Fuel Supply

Overview

The fuel supply system delivers fuel to an internal combustion engine. With carburetors being replaced by fuel injections systems in the late 1980s and 1990s, the most common types of fuel supply system currently in use are throttle body injection (single-point injection), multiport injection (MPI) and direct injection (DI).

Fuel injectors atomize fuel because high pressure is forcing the fuel through a small nozzle in the injector into the intake air stream or the combustion chamber. This process is often controlled by the ECM and is dependent on data received from other sources (e.g. mass air flow sensor, throttle position sensor, etc.) to determine the precise amount of fuel needed for any given operating condition. The primary advantages of fuel

sor, etc.) to determine the precise amount of fuel needed for any given operating condition. The primary advantages of fuel injection over carburetor are improved fuel economy, increased power output and reduced emissions. The following sections will discuss each fuel injection concept in detail.

Throttle Body Injection

Throttle body injection uses a single electrically controlled injector at the throttle body. The fuel is drawn by an electric fuel pump out of the fuel tank and flows through a paper filter into the fuel injector. Since injection happens at the same location as the carburetor, very little engine redesign (intake manifold, fuel line routing, etc.) is necessary. The cost saving of throttle body injection compared to other fuel injection methods encouraged vast adoption in the late 1980s and early 1990s.

Throttle body injection system also inherits many disadvantages of the carburetor. One of them being the inability to precisely control the amount of fuel supplied into each cylinder, and is unable to precisely control combustion and emissions. It also restricts the design of intake manifold as any sharp bends in the intake path will cause atomized fuel to accumulate on the outer wall of the intake path will cause atomized fuel to accumulate on the outer wall of the intake path. Supplying moderate engine heat to the intake manifold is also necessary to ensure that the fuel stay vaporized. This results in a relatively high intake air temperature and compromises performance.

Multiport Injection (MPI)

Multiport injection (MPI) consists of an injector for each cylinder just upstream of the intake valve. The fuel pump delivers the fuel into a high-pressure line where it flows to the fuel rail and injectors. When activated by the ECM, each injector sprays fuel to the intake port of its corresponding cylinder – this allows.

at the intake port of its corresponding cylinder – this allows individual cylinders to receive the right amount of fuel in a more precisely timed manner. Sequential fuel injection mode can be applied to activate each injector individually to improve engine

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injection is still the most comm.

in not economy cars thanks to its simplicity and low manufacturing cos, jection). However, fo further improve driving cost of the common control of the common con

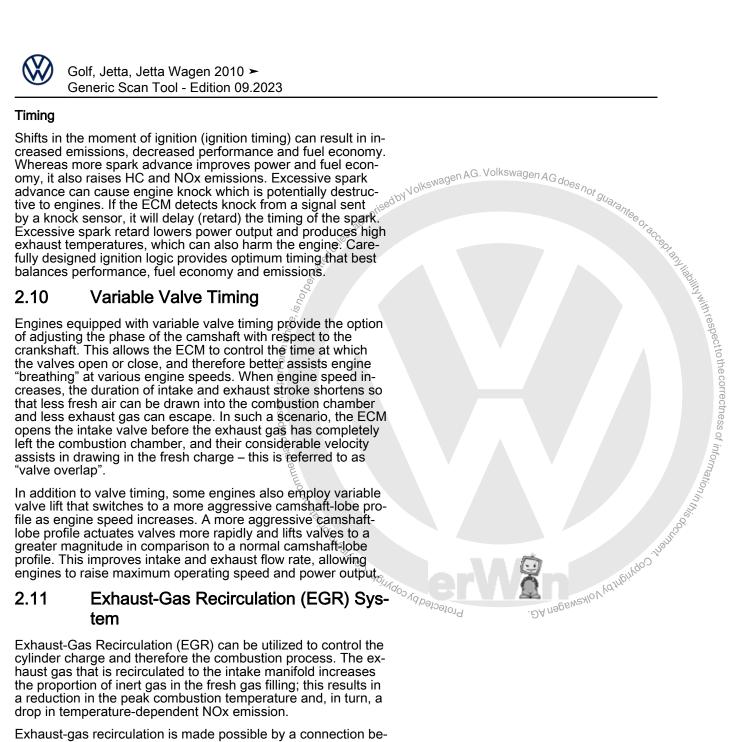
programmed into the ECM as a function of engine speed and load. An optimally calibrated ignition system ensures consistent and reliable ignition under all conditions. Knock or misfire as a result of incorrect ignition can lead to destruction of engine components or damage of the catalytic converter.

drop in temperature-dependent NOx emission.

Exhaust-gas recirculation is made possible by a connection between the exhaust pipe and the intake manifold. Due to the pressure differential, the intake manifold can draw in exhaust gas via this connection. Together with the exhaust-gas recirculation valve, the ECM adjusts the opening cross-section and therefore controls the partial flow tapped from the main exhaust flow. A malfunction in exhaust-gas recirculation system can result in performance loss and increased emissions. In such a scenario, the Malfunction Indicator Lamp (MIL) lights up and a Diagnostic Trouble Code (DTC) is stored in the ECM memory.

2.12 Secondary Air Injection

Additionally injecting air into the exhaust pipe triggers an exothermic (release of heat) reaction. This leads to the combustion of HC and CO components that prevail mainly during the warm up phase. This oxidation process releases additional heat. Consequently, the exhaust gas becomes hotter, causing the catalytic converter to heat up at a faster rate. For spark-ignition engines, secondary-air injection is an effective means of reducing HC and CO emissions after starting the engine and to rapidly heat up the catalytic converter. This ensures that the conversion of NOx emissions commences earlier.





An electronically controlled valve operates the secondary-air valve (a one-way check valve). The ECM actuates the pump and the control valve, ensuring that secondary air can be injected at a defined point in time. The secondary air must also be injected as close to the outlet valve as possible in order to exploit the high temperatures to utilize the exothermic (release of heat) reaction effectively.

2.13 Exhaust Systems

Overview

There are three important functions of the exhaust system: to reduce the pollutants in exhaust gas, muffle engine combustion noise and to discharge exhaust gas at a convenient location on the vehicle (often underneath the rear bumper). A passengercar exhaust system consists of the following; exhaust manifold, exhaust treatment components, sound absorption components and the system of pipes connecting these components.

Exhaust Manifold

The manifold is an important component in the exhaust system. It routes the exhaust gas out of the cylinder outlet ports into the subsequent exhaust system. The geometry of the manifold (i.e. length and cross-section of the individual pipes) has an impact on the performance characteristics, the acoustic behavior of the exhaust system, and the exhaust temperature. In some cases, the manifold is insulated with an air gap to guickly reach high exhaust temperature and to shorten the time taken by the catalytic converter to reach its operating temperature.

Emission Control

The primary emission control component is the catalytic converter, which breaks down the gaseous pollutants in the exhaust gas (CO, HC and NOx). Catalytic converters are installed as close as possible to the engine so that they can quickly reach their operating temperature and therefore be effective in urban driving. It also bears a sound-absorbing function, especially to the higher frequency portion of the engine combustion noise.

Sound Absorption

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Ite taken by the catalytic connits in the exIte catalytic connits in Mufflers dampen or absorb the noise produced by engine combustion. In principle, they can be installed at any position in the exhaust system. However, they are mostly located in the middle and rear sections of the exhaust system. Depending on the number of cylinders and engine output, generally 1 to 3 mufflers are used in an exhaust system. In V-engines, the left and right cylinder banks are often run separately, each being fitted with its own catalytic converters and mufflers. Although the aim of mufflers is to reduce noise in compliance with legislations, they can also help to create the sound specific to the type of vehicle.

2.14 SCR NOx Catalyst System

In order to convert harmful exhaust gas components (nitrogen oxides) to environmentally compliant components (nitrogen and water) by means of an SCR catalyst, a dosing valve injects the . DA nogswedlo V Valngingo. required amount of reductant into the exhaust system upstream of the SCR catalyst according to the actual demand. The SCR system is controlled and monitored by the SCR control module which communicates with the ECM via CAN Bus. The SCR control module sends its diagnostic information to the ECM by means of CAN messages. The faults are stored in the fault memory of the ECM. Due to the additional SCR catalyst located downstream of the oxidation catalyst and the diesel particulate filter, nitrogen oxide emissions can be nearly eliminated. A urea solution is used as a reducing agent (the reducing agent is also referred to as Diesel Exhaust Fluid), which is injected into

the exhaust system in small quantities. The amount of injected reductant depends on the temperature upstream of the SCR catalyst, the exhaust gas flow rate, and the raw NOx emissions. The target of the dosing strategy is to provide the SCR catalyst with a sufficient amount of reductant for all driving conditions.

- The SCR system consists of multiple components to function properly. These components are explained below.
- ♦ ⇒ "2.14.1 Reducing Agent Quality Sensor G849", page 14
- ♦ ⇒ "2.14.2 Reducing Agent Injector N474", page 14
- ♦ "2.14.3 Reducing Agent Metering System Delivery Unit GX19", page 14
- ♦ "2.14" Reducing Agent Metering System Pressure Sensor G686", page 15
- ♦ = "2.44.5 Reducing Agent Heater Control Module J891", page 15

2.14.1 Reducing Agent Quality Sensor - G849-

The expected quality signal is divided by the quality sensor signal. The diagnostic compares this ratio to threshold limits.

2.14.2 Reducing Agent Injector - N474-

The injection of the reductant works similarly to the injection of fuel. The SCR dosing valve injects the reductant into the exhaust gas flow upstream of the SCR catalyst. The amount of reductant that is injected is determined by the opening time of the SCR dosing valve. This opening time depends on the temperature of the exhaust gas stream upstream of the SCR catalyst, the exhaust gas flow rate and the engine's NOx emissions.

2.14.3 Reducing Agent Metering System Delivery Unit - GX19-

The delivery system, filter, pressure pump, return flow pump, damper, level and temperature sensor is an integrated module which is in the bottom of the DEF tank. The output is a multiplexed PWM signal which includes following information: DEF level and DEF temperature.

- Reducing Agent Pump V437-
- ◆ The three-phase AC motor of the SCR dosing pump is driven by a pulse-width modulated three-phase current. The monitoring of the supply lines works in different ways, depending on whether the SCR dosing pump is turned on or off. If the SCR dosing pump is running, the current is monitored, and if the current exceeds a defined threshold value, the voltage will also be monitored. If the SCR dosing pump is off, only the voltage is monitored, which is set via the corresponding driver power stages. One phase current is used to calculate the total current while the pump is running. The monitoring of the total current and the voltage at the output terminals of the power stage for the SCR pump takes place in the SCR control module, which transmits the corresponding fault messages to the ECM, where the fault is stored in the fault memory.
- Reducing Agent Return Flow Pump V561-
- To avoid crystallization of urea after long vehicle parking and freezing of urea under very cold conditions the backflow pump is used to empty the urea lines after each engine stop during keep alive time.



- Reducing Agent Reservoir Sensor G697-
- To monitor the fluid level in the reductant tank, a fluid level sensor is used, which gathers information on the fluid level with the help of a Reed switch. Each voltage value transmitted by the fluid level sensor corresponds to one defined fluid level. Some SCR systems will receive an ultrasonic level sensor, which is able to display continuously the tank level over the whole range from full to empty tank warning level. Therefore refilling detection is always possible if a minimum of about 1 gallon is refilled. This sensor sends an ultrasonic impulse and receives the echo which is reflected at the DEF surface. The time between sending and receiving the impulse correlates with the DEF level. The sensor sends a multiplex PWM-signal (tank level and temperature) to the ECU. This signal contains status and fault information about the level signal (frequency, duty cycle). The signal is evaluated by the sensor driver. The driver information is used by several monitoring functions.
- Reducing Agent Temperature Sensor G685-
- In order to check the temperature value provided by the SCR tank temperature sensor, a comparison with the ambient air temperature is carried out. If this comparison raises doubt about the correctness of the reductant temperature value and the ambient air temperature is less than a defined threshold value, the SCR tank heater is commanded on and at the same time the increase of the reductant temperature value is monitored. This is to make sure that the comparison of the SCR tank temperature and the ambient air temperature does not produce a wrong result due to a potentially frozen reductant.

Reducing Agent Metering System 2.14.4 Pressure Sensor - G686-

The monitor checks if the pressure values measured in the SCR line before the pressure buildup phase are within the physically possible range. The pressure sensor measures the existing pressure in the SCR line and transmits the values to the SCR control module which then transmits them to the ECM where the pressure values are monitored.

Juit 2) - Z103
Circuit 2) - Z104
Jor the tank and the dosing since the reductant freezes at selow zero Celsius (12 degrees electronic freezes) sistance heater thaws the reductant and a low-side driver, the current of which separately. The advantage of this is that, acuit is detected in one, the other driver can be so ensure component protection. The SCR heater may has pull-up and pull-down resistors, which are used into the lines when the heater is not active. For this pose, a transistor is used to switch defined voltage levels as high Ohmic resistors (pull-up, pull-down) and the voltage of the corresponding lines is monitored. The circuit monitoring of the SCR dosing line heater takes place in the SCR control nodule, which transmits the fault messages to the ECM, where a corresponding fault is stored in the fault memory.

Nolkswagen **Diagnosis and Testing** 3

- ⇒ "3.1 Preliminary Check", page 16
- ⇒ "3.2 Readiness Code", page 17
- ⇒ "3.3 Diagnostic Modes 01 09", page 19
- ⇒ "3.4 Engine DTC Tables ", page 36
- ⇒ "3.5 Transmission DTC Tables", page 151
- ⇒ "3.6 Diagnostic Procedures", page 202

3.1 **Preliminary Check**



Note

- Before performing any pin point test or component diagnosis, a Preliminary Check must be performed.
- Check for Technical Bulletins that may supersede any information included in the repair manual or GST Manual.
- For Electrical Testing: Refer to ⇒ page 16.
- For Fuel System Mechanical Testing: Refer to ⇒ page 17.
- ◆ For Oxygen Sensor Preliminary Tests: Refer to <u>⇒ page 17</u>



Electrical Testing

	Golf, Jetta, Jetta Wagen 2010 ➤ Generic Scan Tool - Edition 09.2023	Melkeur
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3	Diagnosis and Testing	guarantee
♦ ⇒ "	3.1 Preliminary Check", page 16	O ROCK
♦ <u>⇒</u> "	3.2 Readiness Code", page 17	Orang.
♦ ⇒ "	3.3 Diagnostic Modes 01 – 09 ", page 19	le la
♦ <u>⇒</u> "	3.4 Engine DTC Tables ", page 36	
♦ ⇒ "	3.5 Transmission PTC Tables", page 151	resp
♦ ⇒ "	3.6 Diagnostic Procedures", page 202	oct to
3.1	Preliminary Check	the co
♦ Be	Note fore performing any pin point test or component di	agno- y infor- 17. 19e 17. 17. 18. 19. 19. 19. 19. 19. 19. 19
♦ Ch	a Preliminary Check must be performed. eck for Technical Bulletins that may supersede an tion included in the repair manual or GST Manual.	y infor-
♦ For	Electrical Testing: Refer to <u>⇒ page 16</u> .	
♦ For	Fuel System Mechanical Testing: Refer to <u>⇒ pag</u>	e 17
♦ For	Oxygen Sensor Preliminary Tests: Refer to <u>⇒ pa</u>	ge 17 . Q
Electri	cal Testing	ESWEMO Vain
	-109101	
Step	Procedure	Result / Action to Take
Step 1	Procedure • CONNECT: Scan Tool.	- YES:
	Procedure	 YES: GO TO: Step 2 ⇒ page 16 .
	CONNECT: Scan Tool.	- YES:
1	CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored?	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16.
	CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs.	 YES: GO TO: Step 2 ⇒ page 16 . NO:
1	CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored? Repair these DTCs first before performing	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16. GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 36. YES: GO TO: Step 4 ⇒ page 16.
2	CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored? Repair these DTCs first before performing any of the following steps. Using the Scan Tool, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24. Perform a road test to attempt to duplicate the customers complaint.	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16. GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 36. YES:
2	CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored? Repair these DTCs first before performing any of the following steps. Using the Scan Tool, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory ", page 24. Perform a road test to attempt to duplicate the customers complaint. Does DTC return?	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16. GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 36. YES: GO TO: Step 4 ⇒ page 16. NO: GO TO: Step 5 ⇒ page 16.
2	CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored? Repair these DTCs first before performing any of the following steps. Using the Scan Tool, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24. Perform a road test to attempt to duplicate the customers complaint.	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16. GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 36. YES: GO TO: Step 4 ⇒ page 16. NO:
2	CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored? Repair these DTCs first before performing any of the following steps. Using the Scan Tool, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 − Erase DTC Memory ", page 24 . Perform a road test to attempt to duplicate the customers complaint. Does DTC return? Perform the diagnostic procedure for that	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16. GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 36. YES: GO TO: Step 4 ⇒ page 16. NO: GO TO: Step 5 ⇒ page 16. GO TO: Refer to ⇒ "3.4 Engine DTC Tables To page 16.
3	 CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored? Repair these DTCs first before performing any of the following steps. Using the Scan Tool, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 24. Perform a road test to attempt to duplicate the customers complaint. Does DTC return? Perform the diagnostic procedure for that DTC. 	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16. GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 36. YES: GO TO: Step 4 ⇒ page 16. NO: GO TO: Step 5 ⇒ page 16. GO TO: Refer to ⇒ "3.4 Engine DTC Tables", page 36. Perform a road test to verify the repair. Generate readiness code. Refer to ⇒
3	 CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored? Repair these DTCs first before performing any of the following steps. Using the Scan Tool, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 24. Perform a road test to attempt to duplicate the customers complaint. Does DTC return? Perform the diagnostic procedure for that DTC. FAULT: Intermittent or a sporadic condition. CHECK: Suspected components. PERFORM: Visual Inspection of wiring and components. 	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16. GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 36. YES: GO TO: Step 4 ⇒ page 16. NO: GO TO: Step 5 ⇒ page 16. GO TO: Refer to ⇒ "3.4 Engine DTC Tables", page 36. Perform a road test to verify the repair.
3	 CONNECT: Scan Tool. IGNITION: ON. CHECK: For stored or related DTCs. Were any other DTCs stored? Repair these DTCs first before performing any of the following steps. Using the Scan Tool, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 24. Perform a road test to attempt to duplicate the customers complaint. Does DTC return? Perform the diagnostic procedure for that DTC. FAULT: Intermittent or a sporadic condition. CHECK: Suspected components. PERFORM: Visual Inspection of wiring and 	 YES: GO TO: Step 2 ⇒ page 16. NO: GO TO: Step 3 ⇒ page 16. GO TO: Proper Diagnostic procedure per the stored DTC. Refer to ⇒ "3.4 Engine DTC Tables", page 36. YES: GO TO: Step 4 ⇒ page 16. NO: GO TO: Step 5 ⇒ page 16. GO TO: Refer to ⇒ "3.4 Engine DTC Tables", page 36. Perform a road test to verify the repair. Generate readiness code. Refer to ⇒

Fuel System Mechanical Testing

Check the following items for possible mechanical delivery deficiency:

- Fuel level in tank is too low.
- Fuel lines pinched.
- Fuel filter plugged.
- Fuel pump delivery unit internal leak.
- Clogged injectors.
- Poor fuel quantity delivery. Refer to appropriate repair man-

Oxygen Sensor Preliminary Tests

Check for the following conditions which can cause Oxygen Sensor Faults to set without requiring Oxygen Sensor replacement:

Common issues for lean faults:

- e repair man
 Pe
 Nagen AG. Volkswagen AG does not guarantee of acceptant light with respect to the correctness of info Vacuum leaks - check for failed or loose vacuum lines, leaking intake gaskets, or any other source of un-metered air leaks (leaks after the Mass Air Flow Sensor).
- Restricted fuel filter or bent/pinched fuel system lines.
- Incorrect input from other sensors, such as the Mass Air Flow Sensor, which may not always set a fault.
- Engine misfire.
- Exhaust leaks.
- Camshaft timing.

Common issues for rich faults:

- Leaking or faulty fuel injector.
- Fuel injector driver shorted in ECM, or wiring short for injectors (short to ground).
- Leaking or faulty fuel pressure regulator or restricted return Protectedby
- Faulty fuel pump or fuel pump driver module.
- Incorrect input from other sensors, such as the Mass Air Flow Sensor, which may not always set a fault.
- Aftermarket components or performance chips.
- Camshaft timing.

3.2 Readiness Code

Readiness code description

Diagnostics are performed at regular intervals during normal vehicle operation. After repairing an emissions related system, a readiness code is generated by road testing the vehicle.

If a malfunction is recognized during the drive cycle, it will be stored in the DTC memory.

The OBD drive cycle operation will be monitored with a hand held diagnostic tool. Consult the manufacturer's instruction manual for correct tool operation.

The readiness code is erased every time the DTC memory is erased or any time the battery is disconnected. If the DTC





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Jeric Scan Tool - Edition 09.2025

As been erased or the battery is disconnecess code must be generated.

As Volkswagen Ag.

General recommendations

Most monitors will complete easier and quicker using a "steady-"oot" and "smooth" acceleration during the drive cycle operation, "ise, and acceleration modes.

Ting Conditions

TVAP monitor test, the coolant temperature and the amaperature must be between 10° C and 35° C with a "tween them no greater than 4° C during the drive (e.g. when driving out of a heated workshop in

**Ty.

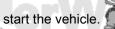
**Ty.

**It be between 80° C and 110° C.

**Pust be between 10° C and 35°

Im of 12.5 volts.

O2 heatrge sys-**



- Drive the vehicle at 45-55 mph for a continuous 7 minute period - avoid stopping. This executes the evaporative, O2 sensor, fuel trim, and misfire monitors.
- Accelerate the vehicle to an engine speed of 5000 RPM; lift off the throttle until the engine speed is around 1200 RPM. This executes the fuel cut off.
- Accelerate the vehicle smoothly to 60-65 mph, cruise constantly for 5 min, this executes the catalyst; O2 sensor, misfire, fuel trim, and purge system monitors.
- Decelerate and idle the vehicle again for 3 minutes. This executes the misfire, secondary sir injection, fuel trim, and purge system monitors.
- Check the status of the readiness code.



Note

Depending on the scan tool used. The readiness code status may be displayed as complete, passed or OK.

If any engine monitor fails the drive cycle test. Repeat the drive cycle test until all engine monitors have successfully run through and passed.





Note

When repeating the drive cycle operation for a failed evaporative or thermostat monitor, allow the engine to cool until the coolant temperature and the ambient air temperature are be between 10° C and 35° C with a difference no greater than 4° C and repeat the drive cycle operation.

If the drive cycle operation fails again.

- Check the DTC memory for stored DTCs.

Repair the vehicle if necessary.

- Repeat the drive cycle operation until all engine monitors have successfully run through and passed.
- Remove the scan tool and switch the ignition off.

3.3 Diagnostic Modes 01 – 09

The information provided in Modes 01 through 09 displays the various levels of emission related data that may be monitored, as well as the ability to retrieve and read stored DTC trouble codes, erase stored DTC trouble codes, generate readiness codes, and select the various PIDs and Test-IDs used within the modes to monitor the engine, and emission related component parameters.



mercial purposes, in part or in whole

Note

Depending on scan tool and protocol used the information in diagnostic mode 01 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), or On-Board Diagnostic Monitor Identifier (OBDMID).

- ♦ ⇒ "3.3.1 Diagnostic Mode 01 Read Current System Data"
 page 20
- ◆ ⇒ "3.3.2 Diagnostic Mode 02 Read Operating Conditions", page 21
- ♦ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page
 23
- ♦ ⇒ "3.3.4 Diagnostic Mode 04 Erase DTC Memory ", page 24
- ♦ "3.3.5 Diagnostic Mode 06 Read Test Results for Specific Diagnostic Functions", page 25
- ♦ "3.3.6 Diagnostic Mode 07 Read Faults Detected During the Current or Last Driving Cycle", page 33
- ◆ ⇒ "3.3.7 Diagnostic Mode 08 Request Control of On-Board System, Test or Component", page 34
- ⇒ "3.3.8 Diagnostic Mode 09 Read Vehicle Information"
 page 34
- ◆ 3.3.9 Diagnostic Mode 0A Check Permanent DTC

 Memory", page 35

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3.3.1 Diagnostic Mode 01 – Read Current System Data



Note

Depending on scan tool and protocol used, the information in diagnostic mode 01 may be referred to by different names such as Test-ID (TID), Hex-ID, Component-ID (CID), or On-Board Diagnostic Monitor Identifier (OBDMID).

Diagnostic Mode 01 makes it possible to access current emissions-related measured values and diagnostic data. The original measured values (no replacement values), input and output data and system status information are displayed using Diagnostic Mode 1.

Test requirement

Coolant temperature at least 80° C.

Procedure

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 1: Obtain data".
- From the following table, select the desired "PID" that is to be monitored, e.g. "PID \$05 Coolant Temperature".

The current values of the component or system that is being monitored will be displayed on the scan tool screen.

PID	Component or System
\$01:	Monitoring Status Since Erasing DTC Memory
\$04:	Calculated Load Value
\$05:	Cootant Temperature
\$0B:	Manifold Absolute Pressure
\$0C:	Engine RPM
\$0D:	Vehicle Speed %
\$0F:	Intake Air Temperature
\$10:	Air Flow Rate
\$13:	Location Of Oxygen Sensor
\$1C:	OBD Status Of Vehicle
\$1F:	Time Since Engine Start
\$21:	Distance Driven With MIL On
\$23:	Fuel Pressure
\$24:	Bank 1 Sensor 1 (Wide Range O2S)
\$25:	Bank 1 Sensor 2 (Wide Range O2S)
\$2C:	Commanded EGR Position
\$2D:	EGR Error Between Actual And Commanded
\$2F:	Fuel Level (If Used For Diagnostics)
\$30:	Number Of Warm Up Cycles Since Fault Memory Cleared
\$31:	Distance Driven After Fault Memory Cleared
\$33:	Barometric Pressure
\$3C:	Catalyst Temperature Bank 1 Sensor 1
\$3D:	Catalyst Temperature Bank 2 Sensor 1

PID	Component or System				
\$3E:	Catalyst Temperature Bank 1 Sensor 2				
\$3F:	Catalyst Temperature Bank 2 Sensor 2				
\$41:	Monitor Status (Diesel)				
\$42:	Engine Control Module System Voltage				
\$43:	Absolute Load				
\$45:	Absolute Load Relative Throttle Position AG. Volkswagen AG does not guarantee				
\$46:	Ambient Temperature				
\$49:	Absolute Redal Position				
\$4A:	Redundant Absolute Pedal Position				
\$4C:	Commanded Throttle Motor Position				
\$4D:	Engine Run Time While MIL Is Activated				
\$4F:	External Test Equipment Configuration Information #1				
\$5D:	Fuel Injection Timing				
\$5E:	Engine Fuel Rate				
\$61: ^{.i.} .	Driver's Demand Engine - Percent Torque				
\$62:	Actual Engine Percent Torque				
\$63:	Engine Reference Torque				
\$65:	Auxiliary Inputs/Outputs				
\$67:	Engine Coolant Temperature				
\$69:	Commanded EGR And EGR Error				
\$6B:	Exhaust Gas Recirculation Temperature				
\$6D:	Fuel Pressure Control System				
\$70:	Boost Pressure Control				
\$71:	Variable Geometry Turbo (VGT) Control				
\$73:	Exhaust Pressure				
\$77:	Charge Air Cooler Temperature				
\$78:	Exhaust Gas Temperature (EGT) Bank 1				
\$7A:	Charge Air Cooler Temperature Exhaust Gas Temperature (EGT) Bank 1 Diesel Particulate Filter (DPF) Bank 1 Engine Run Time Total Engine Run Time For AECD				
\$7F:	Engine Run Time				
\$81:	3 2 2 2				
\$8B:	Diesel After Treatment Status				

- Switch the ignition off.

3.3.2 Diagnostic Mode 02 – Read Operating Conditions

When an emissions-related fault (pending DTC, visible in mode 07) is first detected, operating conditions are stored. Mode 02 makes it possible to access this freeze frame data as soon as this fault is shown in mode 03. Each control module only shows freeze frame data for one fault via mode 02. Therefore, there are two priority levels. If there is a malfunction with higher priority, the freeze frame data is overwritten.

- Fault with higher priority: Misfire malfunction or fuel trim malfunction.
- Fault with normal priority: All other emissions-related faults.



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Note

Depending on scan tool and protocol used, the information in diagnostic mode 02 may be referred to by different names such as Test-ID, Hex-ID, Component-ID, or On-Board Diagnostic Monitor Identifier (OBDMID).

Procedure

In an idle.

Procedure

In an in a idle.

In an id



PID o	Component or System				
\$02: 74 \$04: 504: \$05:	DTC Which Triggered Freeze Frame Data				
\$04:	Calculated Load Value				
\$05:	Coolant Temperature				
\$0B:	Manifold Absolute Pressure				
\$0C:	Engine RPM MARAGEMENT AND THE MARKET				
\$0D:	Vehicle Speed				
\$0E:	Ignition Timing Advance For # 1 Cylinder				
\$0F:	Intake Air Temperature				
\$10:	Air Flow Rate				
\$11:	Absolute Throttle Position				
\$1F:	Time Since Engine Start				
\$23:	Fuel Pressure				
\$2C:	Commanded EGR Position				
\$2D:	EGR Error Between Actual And Commanded				
\$33:	Barometric Pressure				
\$42:	Engine Control Module System Voltage				
\$46:	Ambient Temperature				
\$49:	Absolute Pedal Position				
\$4A:	Redundant Absolute Pedal Position				
\$4C:	Commanded Throttle Motor Position				
\$51:	Type Of Fuel Currently Being Used				
\$5D:	Fuel Injection Timing				
\$5E:	Engine Fuel Rate				
\$61:	Driver Demand - Engine Torque Percent				
\$62:	Actual Engine Torque Percent				
\$63:	Engine Reference Torque				
\$67:	Engine Coolant Temperature				

PID	Component or System				
\$69:	Commanded EGR And EGR Error				
\$6B:	Exhaust Gas Recirculation Temperature				
\$6D:	Fuel Pressure Control System				
\$70:	Boost Pressure Control				
\$71:	Variable Geometry Turbo (VGT) Control				
\$73:	\$73: Exhaust Pressure Sensor Bank 1				
\$77:	Charge Air Cooler Temperature				
\$78:	Exhaust Gas Temperature (EGT) Bank 1				
\$7A:	Diesel Particulate Filter (DPF) Bank 1				
\$7F:	Engine Run Time				
\$8B:	Diesel After Treatment Status				

Switch the ignition off.

3.3.3 Diagnostic Mode 03 – Read DTC Memory

Diagnostic Mode 03 makes it possible to read emissions-related faults (confirmed DTCs: faults which/have activated the MIL) in the ECM and in the TCM well activated the MIL) in

When the ECM recognizes an emission related fault it turns on the malfunction indicator lamp. If an electronic throttle malfunction is recognized, the ECM turns on the electronic power control warning lamp. Both are located in the instrument cluster.

The DTCs are sorted by SAE code with the DTC tables consisting of a 5 digit alpha numeric value.



Note

Depending on scan tool and protocol used, diagnostic mode 03 and the information provided may be referred to by a different name.

The following tables provide a breakdown and explanation of the DTC code.

P-Codes

Compor	Component group						
P og	х	х	х	х	DTC for the drivetrain		
Norm-C	Norm-Code						
Р	O CUISC	x	х	X	Trouble codes defined by SAE with specified malfunction texts		
Р	1 0	X GUAGOO	x		Additional emission relevant DTCs provided by the manufacturer		
Р	2	X Ngpa	X _{101.1}	x	DTCs defined by SAE with specified texts, from MY 2000		
Р	3	х	X	х	Additional emission relevant DTCs provided by the manufacturer from MY 2000		

Component group					
Repair	Repair group				
P x 0 x Fuel and air mixture and additional emission regulations					

P	x	1	x	x	Fuel and air ratios
Р	х	2	х	x	Fuel and air ratios
Р	х	3 50	x	х	Ignition system
Р	х	4%	х	x	Additional exhaust system
Р	х	5	x	x	Speed and idle control
Р	х	6	x	х	Control module and output signals
Р	х	7	х	х	Transmission
Р	х	8	х	х	Transmission
Р	х	9	х	x	Control modules, input and output signals
		3			

U-Codes

Comp	onent gr	oup 9	5			Nin t	
U	х	х	X	х		DTC for network (CAN bus)	
Norm-	Norm-Code June 1						
U	0	х	X1000 in	X		Trouble codes defined by SAE with specified malfunction texts	
BAnegaweylo Vydry							

Procedure

- Connect the scan tool.
- Switch the ignition to the ON position.
- Select Diagnostic Mode 03: Interrogating fault memory.
- The stored DTC or DTCs will be displayed on the scan tool screen.

The following table is an example of the DTC information that may be displayed on the scan tool screen:

Indication example	Explanation
P0444	SAE Diagnostic Trouble Code
Evaporative emission canister purge regulator valve	Malfunctioning wiring path or malfunctioning component
Circuit open	Malfunction type as next

- Refer to the DTC tables for the diagnostic repair procedures.
- Switch the ignition off.

3.3.4 Diagnostic Mode 04 – Erase DTC Memory

Diagnostic Mode 04 makes it possible to erase the DTC memory and to reset all emissions-related diagnostic data. In that way, all faults in the DTC memory in the ECM and TCM are erased. The adaptation values may also be reset.

Emissions-related diagnostic data includes (as applicable):

- MIL Status
- Number of DTCs
- Readiness bits
- Confirmed DTCs

- Pending DTCs
- DTC that belongs to freeze frame
- Freeze frame data
- Test results of specific diagnostic functions
- Distance driven with "MIL ON"
- Number of warm-up cycles after erasing the DTC memory
- Distance driven after erasing the DTC memory
- Misfire counter



Note

Depending on scan tool and protocol used, diagnostic mode 04 and the information provided may be referred to by a different

at the scan tool.

In the ignition on.

It bignostic Mode 03: Interrogating fau.

In select Mode 4: Reset/delete diagnostic data.

Can tool will display: Diagnostic data are being erase.

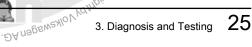
Witch the ignition off.

3.5 Diagnostic Mode 06 – Read Test Results for Specific Diagnostic Functions

Jiagnostic Mode 08 makes it possible to retrieve test results for special components and systems which are continuously or not continuously monitored. If the diagnostis of a system is compared to the first of the diagnostic result and are corresponding thiesholds are saved an displayed in this data remains saved (even with the ignition off) until either new diagnostic results "ecome available or the DTC memory is erased.

**in & max values for each individual test in Mode 06 repremin & max values for each individual fatermarket scan for development of their scan tool. Depending angused; the min & max values shown may on or down to the nearest decimal point development of the neare

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Work procedure

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 Coolant temperature at least 80° C.

 prk procedure

 Connect the scan tool.

 Start the engine and let run at idle speed.

 '104è 6: Check / test the results of components that

 '104 will be displayed on

 'may

 This

Select the desired Test-ID.

The current minimum and maximum values will be displayed on the scan tool screen.

The following table is a numerical list of all "Test-IDs" that may be selected.

Monitor-ID	Component or System
\$01: <u>⇒ page 26</u>	Oxygen Sensor Monitor Bank 1 – Sensor 1
\$02: <u>⇒ page 27</u>	Oxygen Sensor Monitor Bank 1 – Sensor 2
\$21: <u>⇒ page 28</u>	Catalytic Converter Monitoring
\$31: <u>⇒ page 28</u>	EGR Control Loop
\$81: <u>⇒ page 29</u>	Zero Fuel Calibration Monitor
\$85: <u>⇒ page 29</u>	Boost Pressure Control Loop
\$90: <u>⇒ page 30</u>	NOx Absorber Efficiency
\$A2: <u>⇒ page 30</u>	Mis-Fire Cylinder 1 Data
\$A3: <u>⇒ page 31</u>	Mis-Fire Cylinder 2 Data
\$A4. <mark>≱₁page 31</mark>	Mis-Fire Cylinder 3 Data
\$A5: <u>⇒ page 32</u> ,,,,	Mis∍Fire Cylinder 4 Data
\$B2: <u>⇒ page 32</u>	Particulate Matter Trap Efficiency

Monitor-ID \$01: Oxygen Sensor Monitor Bank 1 - Sensor 1

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$01".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$C1	P013 3	HO2 Sensor Bank 1, Sensor 1 Dynamic Check Part 1.	0.0 s	6,553.5 s	Refer to DTC P0133 in the DTC summary table. ⇒ page 54
\$C2	P013 3	HO2 Sensor Bank 1, Sensor 1 Dynamic Check – Part 2.	0.0 s	6,553.5 s	Refer to DTC P0133 in the DTC summary table. ⇒ page 54
\$C4	P219 5	HO2 Sensor Bank 1, Sensor 1 Plausibility Check – Part Load.	0.0%	100.01%	Refer to DTC P2195 in the DTC summary table. ⇒ page 128
\$C4	P219 6	HO2 Sensor Bank 1, Sensor 1 Plausibility Check – Part Load.	0.0%	100.01%	Refer to DTC P2196 in the DTC summary table. ⇒ page 129



Test-	DTC	Component or System	Min.	Max.	Additional Information				
ID		unies		IVIGAL	Cop.				
\$C5	P219 5	HO2 Sensor Bank 1, Sensor 1 Plausibility Check Over Run.	0.0%	100.01%	Refer to DTC P2195 in the DTC summary table. ⇒ page 128				
\$C5	P219 6	HO2 Sensor Bank 1, Sensor 1 Plausibility Check – Over Run.	0.0%	100.01%	Refer to DTC P2196 in the DTC summary table > page 129				
\$C6	P014 D	HO2 Sensor Bank 1, Sensor 1 Dynamic Check With Bank 1, Sensor 2.	0.0 s	6,553.5 s	Refer to DTC P014Din the DTC summary table. page 59				
\$C7	P013 3	HO2 Sensor Bank 1, Sensor 1 Dynamic Check – Part 2.	0.0 s	6,553.5 s	Refer to DTC P0133 in the DTC summary table. page 54				
fied Men diag	 If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure = "3.3.3 Diagnostic Mode 03 - Read DTC Memory", page 23. Switch the ignition off. Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 - Sensor 2 Connect the scan tool. Start the engine and run at idle. Select "Diagnostic Mode 06: Check / test the results of com- 								
Swit	ch the	ignition off.			(M)				
Monitor	Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 – Sensor 2								
- Con	- Connect the scan tool.								
- Star	- Start the engine and run at idle.								
	 Select "Diagnostic Mode 06: Check / test the results of com- ponents that are not continuously monitored". 								
~	L + "A - " - ID 000"								

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure \$\(\frac{3.3.3 \text{ Diagnostic Mode 03}}{23}\).
- Switch the ignition off.

Monitor-ID \$02: Oxygen Sensor Monitor Bank 1 - Sensor 2



- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$02".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$C1	P013 9	HO2 Sensor Bank 1, Sensor 2 Dynamic Check Part 1.	0.0 s	6,553.5 s	Refer to DTC P0139 in the DTC summary table. ⇒ page 56
\$C2	P013 9	HO2 Sensor Bank 1, Sensor 2 Dynamic Check – Part 2.	0.0 s	6,553.5 s	Refer to DTC P0139 in the DTC summary table. ⇒ page 56
\$C4	P227 0	HO2 Sensor Bank 1, Sensor 2 Plausibility Check – Part Load.	0.0%	100.01%	Refer to DTC P2270 in the DTC summary table. ⇒ page 131
\$C4	P227 1	HO2 Sensor Bank 1, Sensor 2 Plausibility Check – Part Load.	0.0%	100.01%	Refer to DTC P2271 in the DTC summary table. ⇒ page 132
\$C5	P227 0	HO2 Sensor Bank 1, Sensor 2 Plausibility Check – Over run.	0.0%	100.01%	Refer to DTC P2270 in the DTC summary table. ⇒ page 131
\$C5	P227 1	HO2 Sensor Bank 1, Sensor 2 Plausibility Check – Over run.	0.0%	100.01%	Refer to DTC P2271 in the DTC summary table. ⇒ page 132
\$C6	P013 B	HO2 Sensor Bank 1, Sensor 2 Dynamic Check With Bank 1, Sensor 1.	0.0 s	6,553.5 s	Refer to DTC P013B in the DTC summary table. ⇒ page 57

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$C7		HO2 Sensor Bank 1, Sensor 2 Dynamic Check – Part 2.	0.0 s		Refer to DTC P0139 in the DTC summary table. ⇒ page 56

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory ", page 23
- Switch the ignition off.

Monitor-ID \$21: Catalytic Converter Monitoring

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$21".

- Select the desired "Test-ID".
- Check specified values at idle.

Test-	DTC	Component or System	Min.	Max.	Additional Information
_ ID				wagen AG. Vo	lkswagen AG do
\$C0	P042 0	Catalytic Converter Monitoring.	0.0, Volk		Refer to DTC P0420 in the DTC summary table page 87

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03. Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure <u>⇒ "3.3.3 Diagnostic Mode 03 –</u> Read DTC Memory ", page 23 .
- Switch the ignition off.

Monitor-ID \$31: EGR Control Loop

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check test the results of components that are not continuously monitored".

- Select the desired "Test-ID".
- Check specified values at idle.

	fied Mem diagi	values nory" to nostic	e components or systems fail to meet, refer to Diagnostic "Mode 03. Interroocheck for stored DTC's or the correspending procedure = "3.3.3 Diagnostic Memory", page 23.	gating Fault sponding		Alfa,	Aliability with respect to the or
_	Swite	ch the	ignition off.				ctto
Мо	nitor-	-ID \$3	1: EGR Control Loop				thec
_	Conr	nect th	e scan tool.				orrec
_	Start	t the er	ngine and run at idle.				otnes
			gnostic Mode 06: Check test the resat are not continuously monitored".	sults of com-			e correctness of information in this co.
Se	lect "	Monito	or-ID \$31".				rmati
_	Sele	ct the	desired "Test-ID".				onin _t
_	Che	ck spe	cified values at idle.				15 00 00 00 00 00 00 00 00 00 00 00 00 00
	est- ID	DTC	Component or System	Min.	Max.	Additional Information	
<u> </u>		50.40		7/40 070 0	0.070.7	1 2 2 2 3 4 6 W/HO'S	╡
\$	C0	P040 1	EGR Control Loop.	-3,276.8 mg/stroke	3,276.7 mg/stroke	Refer to DTC P040¶. in the DTC summary table. ⇒ page	
		·		1119,0000	Joe ^{ford}	84 .DA nagenay	
\$	C0		EGR Control Loop.	-3,276.8	3,276.7	Refer to DTC P0402 in the]
		2		mg/stroke	mg/stroke	DTC summary table. <u>⇒ page</u> 85	



Test- ID	DTC	Component or System	Min.	u _{arantee}	Additional Information
\$C2	P040 2	EGR High Flow.	0.0	19.99	Refer to DTC P0402 in the DTC summary table. ⇒ page 85
\$CA		Low-Pressure EGR Cooler. Cooler Performance Check.	- 3,276.7° C	3,276.7° C	Refer to DTC P2457 in the DTC summary table. ⇒ page 139
\$D0:	P240	EGR Slow Response Positive.	-3,276.8 mg/stroke	3,276.7 mg/stroke	Refer to DTC P240F in the DTC summary table. ⇒ page 135
\$D1:	P240 GF (se	EGR Slow Response Negative.	-3,276.8 mg/stroke	3,276.7 mg/stroke	Refer to DTC P240F in the DTC summary table. ⇒ page 135

- acthess of information informa If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 23
- Switch the ignition off.

Monitor-ID \$81: Zero Fuel Calibration Monitor

- Connect the scan tool
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$81".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$C1		Zero Fuel Calibration Monitor Cylinder 1.	0.0 µs	6,553.5 µs	Refer to DTC P0263 in the DTC summary table. ⇒ page 68
\$C2	P026 6	Zero Fuel Calibration Monitor Cylinder 2.	0.0 µs	6,553.5 µs	Refer to DTC P0266 in the DTC summary table. ⇒ page 69
\$C3	P026 9	Zero Fuel Calibration Monitor Cylinder 3.	0.0 µs	6,553.5 µs	Refer to DTC P0269 in the DTC summary table. ⇒ page 70
\$C4	P027 2	Zero Fuel Calibration Monitor Cylinder 4.	0.0 µs	6,553.5 µs	Refer to DTC P0272 in the DTC summary table. ⇒ page 72

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure

 "3.3.3 Diagnostic Mode 03 Read DTC Memory ", page 23
- Switch the ignition off.

Monitor-ID \$85: Boost Pressure Control Loop

Connect the scan tool.

- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$85".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$C3	P00 AF	Charge Air Boost Pressure Control Loop.	0.0%	100.01%	Refer to DTC P00AF in the DTC summary table. ⇒ page 45
\$CA	P026 A	Charge Air Cooler Under-Cooling.	KSWA90.0	19.99 ^A G	Refer to DTC P026A in the DTC summary table. ⇒ page 71

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 23.
- Switch the ignition off.

Monitor-ID \$90: NOx Absorber Efficiency

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$90".

- Select the desired "Test-ID",
- Check specified values at idle.

Test- ID	DTC	Component of System	Min.	Max.	Additional Information
\$C0	P200 0	NOx Absorber Missing Substrate.	0.0 g		Refer to DTC P2000 in the DTC summary table. ⇒ page
\$C6	P200 0	NOx Absorber Storage Capacity.	0.0 g	65.535 g	Refer to DTC P2000 in the DTC summary table. ⇒ page 117

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 23.
- Switch the ignition off.

Monitor-ID \$A2: Mis-Fire Cylinder 1 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A2".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B		Misfire Cylinder 1, Average Value Over 10 Driving Cycles.	0.0 (counts)		Refer to DTC P0301 in the DTC summary table. ⇒ page 76
\$0C		Misfire Cylinder 1, In This Driving Cycle.	0.0 (counts)		Refer to DTC P0301 in the DTC summary table. ⇒ page 76

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure = "3.3.3 Diagnostic Mode 03 -Read DTC Memory ", page 23
- Switch the ignition off.

Monitor-ID \$A3: Mis-Fire Cylinder 2 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$A3".

- Select the desired "Test-ID".
- Check specified values at idle.

			10/16	wagerrion	THE GOOS POLICE
Test- ID	DTC	Component or System	Min Volk	Max.	Additional Information
\$0B	P030 2	Misfire Cylinder 2, Average Value of Over 10 Driving Cycles.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0302 in the DTC summary table. ⇒ page 78
\$0C	P030 2	Misfire Cylinder 2, In This Driving Cycle.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0302 in the DTC summary table. ⇒ page 78
fied of Memory diagonal Memory	values, nory" to nostic of the character that the erect "Dias"	e components or systems fail to meet refer to Diagnostic "Mode 03: Interrope check for stored DTC's or the correst repair procedure > "3.3.3 Diagnostic Memory", page 23. ignition off. 4: Mis-Fire Cylinder 3 Data e scan tool. Ingine and run at idle. gnostic Mode 06: Check / test the rest are not continuously monitored".	ogating Fault sponding <u>Mode 03 –</u>		Refer to DTC P0302 in the DTC summary table. ⇒ page 78 3. Diagnosis and Testing 31
•		r-ID \$A4".	ó.		S. isam
- Sele	ct the	desired "Test-ID".	14611Xdo		Carupinac
- Che	ck spe	cified values at idle.	Po iyojiMdoo Xqpe	Protect	. J Olkswagen AG.
					3. Diagnosis and Testing 31

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure

 "3.3.3 Diagnostic Mode 03 – Read DTC Memory ", page 23
- Switch the ignition off.

Monitor-ID \$A4: Mis-Fire Cylinder 3 Data

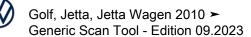
- Connect the scan tool.
- Start the engine and run at run.

 Select "Diagnostic Mode 06: Check / test the resulting ponents that are not continuously monitored".

 "Monitor-ID \$A4".



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Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P030 3	Misfire Cylinder 3, Average Value Over 10 Driving Cycles.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0303 in the DTC summary table. ⇒ page 80
\$0C	P030 3	Misfire Cylinder 3, In This Driving Cycle.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0303 in the DTC summary table. ⇒ page 80

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure <u>⇒ "3.3.3 Diagnostic Mode 03 –</u> Read DTC Memory ", page 23
- Switch the ignition off.

Monitor-ID \$A5: Mis-Fire Cylinder 4 Data

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored.

Select "Monitor-ID \$A5".

- Select the desired "Test-ID".
- Check specified values at idle.

Test- ID	DTC	Component or System	Min.	Max.	Additional Information
\$0B	P030 3	Misfire Cylinder 3, Average Value Over 10 Driving Cycles.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0303 in the DTC summary table. ⇒ page 80
\$0C	P030 3	Misfire Cylinder 3, In This Driving Cycle.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0303 in the DTC summary table. ⇒ page 80
fied Men diag Rea - Swit Monitor - Con - Star - Sele pon Select	values nory" to nostic d DTC ch the -ID \$A nect th the erect "Diagents the Monito"	e components or systems fail to mee, refer to Diagnostic "Mode 03: Interro check for stored DTC's or the corre repair procedure > "3.3.3 Diagnostic Memory", page 23. ignition off. 5: Mis-Fire Cylinder 4 Data e scan tool. Ingine and run at idle. gnostic Mode 06: Check / test the reat are not continuously monitored". ir-ID \$A5". desired "Test-ID". cified values at idle.	et the speciogating Fault sponding Mode 03 –	yVolkswagen A	Additional Information Refer to DTC P0304 in the DTC summary table. ⇒ page 82 Refer to DTC P0304 in the DTC summary table. ⇒ page 82 Refer to DTC P0304 in the DTC summary table. ⇒ page 82
- Che	ck spe	cified values at idle. Component or System	Min	May	Additional Information
ID	ыс	Component of System	IVIII I.	IVIAX.	Additional information
\$0B	P030 4	Misfire Cylinder 4, Average Value Over 10 Driving Cycles.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0304 in the DTC summary table. ⇒ page 82
\$0C	P030 4	Misfire Cylinder 4, In This Driving Cycle.	0.0 (counts)	65,535.0 (counts)	Refer to DTC P0304 in the DTC summary table. ⇒ page 82
fied Men diag <u>Rea</u> - Swit Monitor - Con	values nory" to nostic d DTC ch the -ID \$B	e components or systems fail to mee , refer to Diagnostic "Mode 03: Interro o check for stored DTC's or the corre repair procedure <u>\$\(\pi\) (3.3.3 Diagnostic</u> Memory ", page 23 . ignition off. 2: Particulate Matter Trap Efficiency e scan tool.	t the speci- ogating Fault sponding Mode 03 –	Protected by co.	-DA negswealo Vydłngnygo.

- If any of the components or systems fail to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 "Opposional Control of the Control of the
- Switch the ignition off.

Monitor-ID \$B2: Particulate Matter Trap Efficiency

- Connect the scan tool.
- Start the engine and run at idle.
- Select "Diagnostic Mode 06: Check / test the results of components that are not continuously monitored".

Select "Monitor-ID \$B2".

- Select the desired "Test-ID".
- Check specified values at idle.



Test- ID	DTC	Component or System	Min.	Max. Nkswagen AG.	rolkswagen AG does not			
\$C4	P245 8	No Complete PM Regeneration.	0.0 & by	65,535.0 s	Refer to DTC P2458 in the DTC summary table. = page 140			
\$C5	P245 9	Frequency PM Regeneration.	0.0 g	655.35 g	Refer to DTC P2459 in the DTC summary table. ⇒ page 141	* any liebilities		
\$D1	P200 2	Particulate Matter Trap Missing Over Delta Pressure.	0.0 kPa	655.35 kPa	Refer to DTC P2002 in the DTC summary table. ⇒ page 118	ty with resp		
\$D2	P200 2	Particulate Matter Trap Missing Over Temperature Gradient.	0.0 kPa	655.35 kPa	Refer to DTC P2002 in the DTC summary table. ⇒ page 118	ect to the c		
\$D5	P200 2	Particulate Matter Trap Efficiency Over Delta Pressure EGR-LP Filter.	-32.768 mg/stroke	32.767 mg/stroke	Refer to DTC P2002 in the DTC summary table. ⇒ page 118	orrectnes.		
\$C5 P245 Frequency PM Regeneration. 0.0 g 655.35 g Refer to DTC P2459 in the DTC summary table. ⇒ page 141 \$D1 P200 Particulate Matter Trap Missing 0.0 kPa 655.35 kPa New York Page 118 \$D2 P200 Particulate Matter Trap Missing 0.0 kPa 655.35 kPa 118 \$D5 P200 Particulate Matter Trap Efficiency -32.768 kPa 118 \$D5 P200 Particulate Matter Trap Efficiency 0ver Delta Pressure EGR-LP Filter. mg/stroke 0ver Delta Pres								
Mode 0 which a DTCs).	ing Cycle Mode 07 makes it possible to check emissions-related faults which appeared during the current or last driving cycle (pending DTCs).							
A pendi via Mod	A pending DTC is saved the first time a fault is detected (output via Mode 07).							
– If the	e fault i	s detected again by the end of the fo	llowing					

- If any of the components or systems fall to meet the specified values, refer to Diagnostic "Mode 03: Interrogating Fault Memory" to check for stored DTC's or the corresponding diagnostic repair procedure ⇒ "3.3.3 Diagnostic Mode 03 Read DTC Memory", page 23
- Switch the ignition off.

3.3.6 Diagnostic Mode 07 - Read Faults Detected During the Current or Last Driv

- If the fault is detected again by the end of the following driving cycle, a confirmed DTC is entered (output via Mode 03) and the MIL is activated.
- If this malfunction is not detected again by the end of the following driving cycle, the corresponding pending code will be deleted at the end of the driving cycle.



Note

Depending on scan tool and protocol used, some of the information provided may be referred to by a different name.

Procedure

- Connect the scan tool.
- Start the engine and run at idle.



Note

If the engine does not start, crank the engine using starter for at least 5 seconds. Do not switch the ignition off afterward.



 Select Mode 7: Check test results of components that are continuously monitored.

The number of pending DTCs or 0 malfunctions detected will be displayed on the scan tool screen.

- Refer to the DTC tables for the diagnostic repair procedures.
- Switch the ignition off.

3.3.7 Diagnostic Mode 08 – Request Control of On-Board System, Test or Component

Diagnostic Mode 08 is used to control the operation of an onboard system, test or component. A Mode 8 service can be used to turn on-board system ON or OFF, or to cycle an onboard system, test or component on or off for a specific period of time. The service can also be used to request system status or to report test results.

Function test

No Function Tests are available for this powertrain.

3.3.8 Diagnostic Mode 09 – Read Vehicle Information

Diagnostic Mode 09 makes it possible to access vehicle-specific information from the ECM and the TCM (where applicable).



Note

Depending on scan tool and protocol used, Diagnostic Mode 09 and the information provided may be referred to by a different name.

Test requirement

· No DTCs stored in the DTC memory.

Procedure

- Connect the scan tool.
- Switch the ignition on.
- Select Mode 09: Vehicle information.
- Select the desired "Test-ID".
- The information requested will be displayed on the scan tool screen.

The following table is a numerical list of all "Test-IDs" that may be selected.

Test-ID	Diagnostic text
02:	Vehicle identification number e.g.
	A different 17 digit number will be displayed for each vehicle
04:	Calibration identification e.g.
	◆ Engine Control Module
	Transmission Control Module
06:	CVN (check sum) e.g.



Test-ID	Diagnostic text
	◆ EC5AE460 the check sum is different for every control module version
	◆ 000D105
0A	ECU Name
	◆ Engine Control Module

- Switch the ignition off.

commercial purposes, in part or in whole.

3.3.9 Diagnostic Mode 0A – Check Permanent DTC Memory

Mode 0A - Check Permanent DTC Memory (Request emissions-related diagnostic trouble codes with permanent status after code clear)

Permanent Fault Codes From MY 2010 with Phase-In conforming to CCR 1968.2 (d)(2.2.5): 50% from MY 2010 / 75% from MY 2011 / 100% from MY 2012 The vehicle only participates in Phase-In if all of the OBD-relevant control modules in the vehicle meet these requirements.

Mode 0A may only be supported exclusively by OBD control modules in US vehicles. Mode 0A may not be supported in EOBD vehicles, meaning the control module may not send a response here.

Mode 0A enables the request of all OBD-relevant faults with the status "Permanent Fault Code": - Permanent Fault Codes are Confirmed Fault Codes that are currently activating the MIL. That means faults that are still displayed in Mode 03 but no longer activate the MIL (History Fault Codes) are not Permanent Fault Codes. - Permanent Fault Codes are updated in Mode 0A at the same time as NVRAM storage immediately after switching the ignition off. A newly detected Permanent Fault Code is only visible after switching the ignition off/on in Mode 0A. - Permanent Fault Codes may only be erased in the control module after they are corrected as long as the last diagnostic result was a PASS and the MIL is no longer activated by this fault. The Permanent Fault Codes should be erased from Mode 0A at the same time the MIL switches off when the ignition is switched off/on. - Permanent Fault Codes may not be erased by clearing the DTC memory or disconnecting the power supply. Storage in NVRAM is required. - Permanent Fault Codes may only be erased after clearing the DTC memory under the following conditions: - As long as no FAIL diagnostic result was detected for a Permanent Fault Code - and at least one PASS diagnostic result was detected - and the Minimum Trip Conditions for a General Denominator (without considering high/ambient temperature) were met in this phase in any DCY after erasing the DTC memory. - The engine control module relays the message "Minimum Trip conditions met" to all other OBD control modules via CAN: CAN message OBD_01, Byte 8, Bit 4: OBD_Minimum_Trip - Permanent Fault Codes may NOT be erased if the diagnostic result is FAIL after clearing the DTC memory. A Pending Fault Code should be stored and the DTC memory line should be overwritten with new Freeze Frame data. (Exception: If the Pending Fault Code is corrected without a Confirmed Fault Code being detected, the Permanent Fault Code may also be erased under the conditions described below.) - Permanent Fault Codes should be erased in engine control modules after Update Programming. At this time, all readiness bits (Mode) 01 PID \$01) must be reset to "not complete" [(g)(4.4.6)(D)]. Permanent Fault Codes should not be erased in OBD control modules with Comprehensive Components (CCM) as a single

with respect to the correctness of information

readiness bit if the identical program/data status is being programmed. If a different program/data status is being programmed, Permanent Fault Codes should be erased after Update Programming. - The procedure in Mode 01 through Mode 09 and in the service tester is NOT affected by implementation of the Permanent Fault Codes.

3.4 Engine DTC Tables

• \Rightarrow "3.4.1 Engine Control Module, 2010 – 2014 MY", page $\frac{36}{}$

3.4.1 Engine Control Module , 2010 - 2014 MY AGdoes not

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL-Illumi- nation	Component Diagnostic Procedure
P000 E Fuel Vol- ume Regu- lator Con- trol Ex- cee- ded Learn- ing Limit	HO2 Sensors Adaptive Correc- tion Of	Number of learning points at adaptation limits >= 8 of 64 [-] Upper limit > 1.2		• 100.0 ms	• 2 DCY	- Check the Oxygen Sensor 1 Before Cata- lytic Con- verter GX10- Re- fer to ⇒ "3.6.29 Oxygen Sensor 1 Before Cata- lytic Con- verter GX10 Checking", page 264
		bbei military or	M _{doo} Vd beloeld by	-ĐA nagsw	SHO V V V V V V V V V V V V V V V V V V V	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 261.
P0045 Tur- bo- charg- er/ Su- per- charg- er Boost Con- trol "A" Cir- cuit/ Open	Waste- gate By- pass Regulator Valve Circuit Open	Signal voltage < 4.7 V	ECM power stage = off	• 480.0 ms	• 2 DCY	- Check the Wastegate Bypass Reg- ulator Valve - N75 Re- fer to ⇒ "3.6.34 Wastegate Bypass Reg- ulator Valve N75. Checking", page 274.



DTC / De- scrip- tion	Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure	
P0047 Tur- bo- charg- er/ Su- per- charg- er Boost Con- trol "A" Circuit	gate By- pass Regulator Valve Circuit Short To Ground	• Signal voltage < 2.97 V	ECM power stage = off white the stage is a stage in the stage in	• 480.0 ms	• 2 DCY	- Check the Wastegate Bypass Regulator Valve - N75 Refer to ⇒ "3.6.34 Wastegate Bypass Regulator Valve N75, Checking", page 274 .	
Low P0048 Tur- bo- charg- er/ Su- per- charg- er Boost Con- trol "A" Circuit High		• Signal current > 3.0 A	• ECM power stage = off	• 480.0 ms	• 2 DCY		e transliability with respect to the correctness of information in this occurrence.
Ambi-	Ambient Air Tem- perature Sensor Circuit Range/ Perform- ance	Temperature difference to at least 3 other temperature sensors at startup > 45 K Temperature difference to at least 3 other temperature sensors at startup > 45 K	 Engine off time > 9.0 hrs IAT change after engine start < 5 K ECT sensor 1 or 2 < 30° C Decrease of coolant temperature 1 or 2 after engine start < 5 K 	60.0 s, including 20.0 s continuous driving with velocity exceeding 25 mph Continuous	• 2 DCY	Temperature Sensor G17	f information in this occurrence

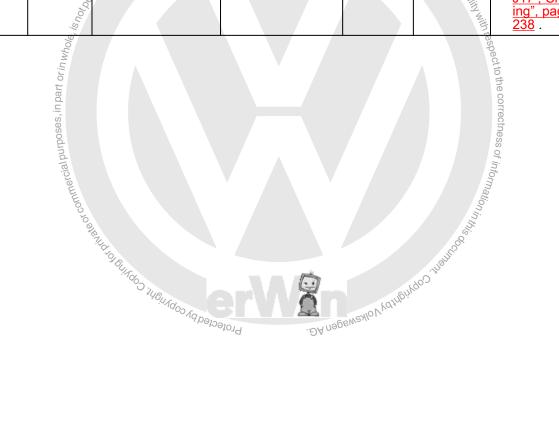
DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Ambi- ent Air	Ambient Air Tem- perature Sensor Circuit Low	Error message sent from cluster to ECU	Communication time after T15 on > 1.0 s	• 2.0 s	• 2 DCY	- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.27 Outside Air Temperature Sensor G17, Checking", page 259 .
						- Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214
Ambi- ent Air	Ambient Air Tem- perature Sensor Circuit High	Error message sent from cluster to ECU Mayor of the property of the prop	Communication time after T15 on > 1.0 s	• 2.0 s	• 2 DCY	- Check the Outside Air Temperature Sensor - G17 Refer to ⇒ "3.6.27 Outside Air Temperature Sensor G17, Checking", page 259 Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.5 CAN-Bus
		ommercial purposes	TO TO TO THOUSE TO THE			Ierminal Resistance, Powertrain, Checking,
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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi-	Component Diagnostic Procedure
	isnotber				Niability with	Pump Relay J17, Check- ing", page 238





De- Sti scrip- De	lonitor trategy escrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure	
Rail/ Co	el Rail essure introl o High	 Control deviation < -200.0 – -300.0 <p>Bar </p> Exceeding absolute rail pressure limits > 1,950.0 Bar 	 Closed loop rail pressure control Delay-time for detection of a defect meteringunit > 90.0 s after engine start 	• 240.0 ms • Continuous	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 16 and/or to appropriate repair manual.	
			in part or in whole is not purposed, in part or in whole is not purposed in part or in par	Profected by College of the College	G. Volkswagen A	- Check the Fuel Pressure Sensor - G247 - Refer to ⇒ "3.6.21 Fuel Pressure Sensor G247 - Checking" page 246 - Check the Fuel Metering Valve - N290 - Refer to ⇒ "3.6.19 Fuel Metering Valve N290 - Checking", Checking",	coeptanyliability with respect to the correctness of information in this obounds by the correctness of t

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
						Pump Relay J17 , Check- ing", page 238
P0090 Fuel Pres- sure Regu- lator "A" Con- trol Cir- cuit/ Open	Pressure Regulator Circuit Open	Signal Voltage < 4.7 V	ECM power stage = perma- nently high	• 0.26 s • Continuous	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.20 Fuel Pressure Regulator Valve N276, Checking", page 244.
		roial purposes, in part or in whole, is not be miles in part or in whole, is not be miles in part or in whole, is not be miles in being the miles in	norised by Volkswagen AG. I			GX1 / Fue B Pump Relay J17 , Check- ing", page
		or commensial purposes, in part or in	Protected by copyright.	-DA ne	ию пру пременя при пременя пре	infomation in the last of the



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Param- eters with Enable Conditions	Monitoring Time Length	Milodijumi- nation oug	Component Diagnostic Procedure
P0091 Fuel Pressure Regulator "A" Control Circuit Low	Fuel Pressure Regulator Circuit Short To Ground	Signal Voltage Signal Voltage 2.97 V Signal Voltage Signal Vo	• ECM power stage = permanently high	• 0.26 s • Continuous	• 2 DCY	- Check the Fuel Pressure Regulator Valve N276 Refer to ⇒ "3.6.20 Fuel Pressure Regulator Valve N276 - Checking", page 244 . - Check the Fuel Metering Valve N290 Refer to ⇒ "3.6.19 Fuel Metering Valve N290 Refer to ⊃ Check the Fuel Delivery Unit - GX1 - / Fuel Pump Relay - J17 Refer to ⇒ "3.6.17 Fuel Delivery Unit GX1 / Fuel Pump Relay J17 Checking", page 238 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Pres-	Pressure Regulator Control	• Signal current > 3.0 A	ECM power stage = perma- nently low aen AG. Volkswagen AG acceptance Den AG. Den AG. Control of AG acceptance Den AG. Den AG. Den AG acceptance Den AG. D	0.26 s Continuous	• 2 DCY	- Check the Fuel Pressure Regulator Valve - N276 Refer to ⇒ "3.6.20 Fuel Pressure Regulator Valve N276, Checking", page 244 .
	in whole, is not bern	ited unless authorised by Volkswe		tes not guarantes	o'accadtany liability with respo	- Check the Fuel Meter- ing Valve - N290 Re- fer to ⇒ "3.6.19 Fuel Meter- ing Valve N290 . Checking", page 242 . Check the
	or commercial purposes, in part or	ata da			Thation in this cool, the same of the same	page 242 . Check the Fuel Delivery Unit - GX1- / Fuel Pump Relay - J17 Refer to ⇒ "3.6.17 Fuel Delivery Unit GX1 / Fuel Pump Relay J17, Checking", page 238 .
		Aido Sidelivados Valorios	Bord DAneg	BW2AIO V VOTABINY	⁷⁰ 00, 18.	<u> </u>



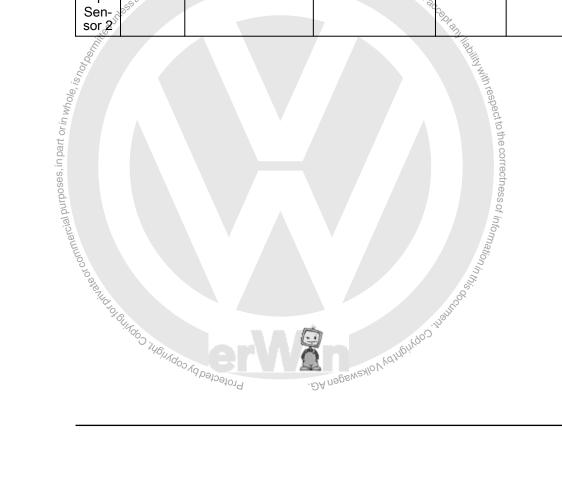
DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
POOR iur-bo-charg-er/ Su-per-charg-er Boost Control "A" Module Per-formanc e	Air Pres- sure Dy- namic	Characteristic value (amplitude of air mass) < 1.0 − 1.7% Actuator stuck open > 17.0% Actuator stuck	 Boost pressure = 715.0 - 1,100.0 hPa Engine RPM < 1,000 RPM Vehicle speed = 0 MPH APP = 0.0% Torque Demand = < 5.0 Nm Friction moment (calculated) < 80.0 Nm Ambient temperature > -20° C ECT > 60° C Throttle valve position = 90.0 - 105.0% Difference between target and actual idle speed < 100 RPM DPF regeneration mode = off Time after start > 9.6 min 	• 10.0 s 10.0 s 10.0 s	• 2 DCY	 Check the Exhaust Door Control Unit - J883 - Refer to ⇒ "3.6.14 Exhaust Door Control Unit J883 - Checking", page 232 - Check the Wastegate Bypass Regulator Valve - N75 - Refer to ⇒ "3.6.34 Wastegate Bypass Regulator Valve N75 - Checking", page 274 - Check the Charge Air Pressure Actuator Position Sensor - G581 - Refer to ⇒ "3.6.6 Charge Air Pressure Actuator Position Sensor - G581 - Refer to ⇒ "3.6.6 Charge Air Pressure Actuator Position Sensor - G581 - Refer to ⇒ "3.6.6 Charge Air Pressure Actuator Position Sensor - G581 - Refer to ⇒ "3.6.6 Charge Air Pressure Actuator Position Sensor - G581 - Refer to ⇒ "3.6.6 Charge Air Pressure Actuator Position Sensor - G581 - Refer to ¬ G581 -
		closed < 17.0%				G581 , Checking", page 216 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P00C 6 Fuel Rail Pressure Too Low- gine Cranki ng Bank 1	Fuel Rail Pressure Control Monitor- ing Of Fuel Pressure During Engine Start (Crank- ing)	• Fuel rail pressure is < 120.0 – 180.0 bar 18	Ambient temples perature > -7° C Battery voltage before cranking 9.5 V Ambient pressure > 740.0 hPa Engine speed > 75 RPM Engine condition = cranking			- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in #3.1 Preliminary Check", page 16 and/or to appropriate repair manual. - Check the Fuel Pressure Sensor - G247 - Refer to #3.6.21 Fuel Pressure Sensor G247 - Check the Fuel Metering Valve - N290 - Refer to #3.6.19 Fuel Metering Valve - N290 - Refer to #3.6.19 Fuel Metering Valve - N290 - Checking", page 242 - Check the Fuel Pressure Regulator Valve - N276 - Refer to #3.6.20 Fuel Pressure Regulator Valve N276 - Checking", page 244 -



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
1	HO2 Sensor Heater Control Perform- ance	Battery voltage < exhaust gas flow rate, exhaust gas temperature at sensor element Sensor temperature < 720° C	 Heater control = active Ambient temperature > -10° C Baro > 750.0 hPa Battery voltage > 10.7 V Modeled dew point = exceeded 	• 20.0 min. (up and down de-bounc-ing)	• 2 DCY	- Check the Oxygen Sensor 1 Before Cata- lytic Con- verter - GX10 Re- fer to ⇒ "3.6.29 Oxygen Sensor 1 Before Cata- lytic Con- verter GX10, Checking", page 264 .
Heat- er Con- trol Circuit	O2S Bank 1 Sensor 2 Heater Output Warm Up Time Ex- ceeded	Battery voltage < f (exhaust gas flow rate, exhaust gas temperature at sensor element) Sensor temperature < 720° C Volkswagen AG. Volkswage	Ambient temperature > -10° C Baro > 750.0 hPa Battery voltage > 10.7 V LSU heater control active Modeled dew point exceeded	• 20.0 min. up and down de-bounc-ing	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 261.



	Generic Scan Tool - Edition 09.2023							
DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure		
P00D 5 HO2S Sen- sor Corre- lation Bank 1 Sen- sor 1 / Bank 1 Sen- sor 2	HO2 Sensor 1 And HO2 Sensor 2 Offset Adaption	Offset air fuel ratio > 0.05 [-] Note: The control of the co	 Battery voltage > 10.7 V Heater control = active Modeled dew point = exceeded Requirements for adaptation: Multiple phases with high and low lambda (total duration of 48.0 s at fuel- 	• 48.0 – 77.0 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Cata- lytic Con- verter - GX10 Re- fer to ⇒ "3.6.29 Oxygen Sensor 1 Before Cata- lytic Con- verter GX10, Checking", page 264.		
or commercial purposes, in part or in whole, is not be		Offset air fuel ratio > 0.05 [-] Nolkswagen AG. Volkingset by Volkswagen AG. Volkingset by	cut off and total duration of 77.0 s at engine speed > 750 RPM and < 930 RPM; inj. quantity > 2.0 mg/ stroke and < 10.0 mg/stroke; air mass > 200.0 mg/stroke and < 350.0 mg/ stroke, calc. lambda < 2.5; coolant temp. > 65° C) are required. EWMA filtering over 10 idle phases.	, ons occur	with respect to the correctness of information is	- Check the Oxygen Sensor 1 Af- ter Catalytic Converter - GX7 Refer to ⇒ "3.6.28 Oxygen Sensor 1 Af- ter Catalytic Converter GX7, Checking", page 261.		
P0101	Mass Air Flow Cir- cuit Plau- sibility Check	 Plausibility check by model air mass min. Ratio of model air mass and actual airflow mass < 0.84 [-] Plausibility check by model air mass max. Ratio of model air mass and actual airflow mass > 1.8 [-] 		1. 4020 -	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270 . - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9. Checking", page 255 . - Check the Mass Airflow		



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time S. Length	MIL Illumi- nation	Component Diagnostic Procedure
	Mass Air Flow Cir- cuit Range Check High Temp. Calcula- ted Value Mass Air Flow Cir- cuit Range Check Low Temp. Calcula- ted Value	PWM signal period time > 60.0 PWM signal period time < 40.0 ms	 Engine running Battery voltage 9.5 V 	• 600.0 s	racad tany liability with respect to	Sensor - G70 Refer to ⇒ "3.6.26 Mass Airflow Sensor G70. Checking". page 257 .
	Mass Air Flow Cir- cuit Low Input	 Range check low calculated value: PWM signal period time > 83 μs (854.0 kg/h) Range check low raw value: PWM signal period time > 71.4 μs (900.0 kg/h) 	 Engine running Delay time after engine running > 1,000.0 ms Battery voltage > 9.5 V Engine speed > 600 RPM Delay Time after Engine running > 1,000.0 ms Battery voltage > 9.5 V 	• 600\0	• 2 DCYation in the Republic of the Property o	- Check the Mass Airflow Sensor - G70 Refer to ⇒ "3.6.26 Mass Airflow Sensor G70. Checking", page 257 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9. Checking", page 255.
P0103 Mass or Vol- ume Air Flow Sen- sor "A" Circuit High	Mass Air Flow Cir- cuit High Input	 Range check high calculated value: PWM signal period time > > 667.0 μs (-57.0 kg/h) Range check high raw value: Raw value PWM signal period time > 833,35 μs (-150 kg/h) 	 Engine running Delay time after engine running > 1,000.0 ms Battery voltage > 9.5 V 	 2,000.0 ms Continuous 600.0 ms Continuous 	• 2 DCY	- Check the Mass Airflow Sensor - G70 Refer to ⇒ "3.6.26 Mass Airflow Sensor G70. Checking", page 257 . - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9. Checking", page 255 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0111 Intake Air Temperature Sensor 1 Circuit Rang e/ Performanc e Bank 1	Intake Air Tempera- ture Sen- sor Cir- cuit Per- formance	Temperature difference to at least 3 other temperature sensors at startup > 30 K Solution Temperature difference to at least 3 other temperature sensors at startup > 30 K Temperature difference to at least 3 other temperature sensors at startup > 30 K Temperature difference to at least 3 other temperature sensors at startup > 30 K Temperature difference to at least 3 other temperature sensors at startup > 30 K Temperature difference to at least 3 other temperature sensors at startup > 30 K Temperature difference to at least 3 other temperature sensors at startup > 30 K Temperature difference to at least 3 other temperature sensors at startup > 30 K Temperature difference to at least 3 other temperature sensors at startup > 30 K Temper	 Engine off time > 32,400.0 s IAT change after engine start < 5 K AAT change after engine start < 5 K Driving speed > 25 mph decrease of coolant temperature 1 or 2 after engine start < 5 K (2 K in case of block heater installation coded) 	• 20.0 s • Continuous	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9 Checking", page 255 . - Check the Mass Airflow Sensor - G70 Refer to ⇒ "3.6.26 Mass Airflow Sensor G70 Checking", page 257 .
	Intake Air Temperas ure Sensod Intake Air Temperas ure Sensod Interest Sensod	0.04 V	• Engine running	• 480.0 ms	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to 3.6.25 Intake Manifold Sensor GX9 Checking", page 255 . Check the Mass Airflow Sensor - G70 Refer to 3.6.26 Mass Airflow Sensor G70, Checking", page 257 .



		20 Ligar			anto	
DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL-Illumi- nation	Component Diagnostic Procedure
	Intake Air Tempera- ture Sen- sor Cir- cuit Open Or Short To Bat- tery voltage	2.88 V	Engine running	• 480.0 ms	• 2 DCY	Check the Intake Manifold Sensor - GX9- Refer to ** "3.6.25 Intake Manifold Sensor GX9, Checking", page 255 . Check the Mass Airflow Sensor - G70- Refer to ** "3.6.26 Mass Airflow Sensor G70, Checking", page 257 .
P0116 En- gine Cool- ant Tem- pera- ture Sen- sor 1 Circuit Rang e/ Per- for- manc e	Tempera- ture Sen- sor Cir- cuit Warm Up Time Plausibili- ty	 Time for coolant of temp to reach 19.96° C or increase by 10 K => 300.0 s for start temp. < 10° C Or > 120.0 s for start temp > 10° C 	 ECT start temp. 19.96° C EST sensors = no faults Note: timer is paused if engine speed < 1,400 RPM or fuel quantity < 9.0 mg / Stroke 	• (See The See	• 2 DCY	- Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.11 Engine Coolant Temperature Sensor G62, Checking", page 226.
P0117 Engine Coolant Temperature Sensor 1 Circuit Low	Coolant Tempera- ture Sen- sor Cir- cuit Short To Ground	Signal voltage < 0.15 V		 480.0 ms Continuous 	• 2 DCY	- Check the Engine Coolant Temperature Sensor - G62 - Refer to ⇒ "3.6.11 Engine Coolant Temperature Sensor G62 , Checking", page 226 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0118 Engine Coolant Temperature Sensor 1 Circuit	cuit Open Or Short To Bat- tery Volt- age	Signal voltage 3.25 Vswagen Active Noticeed by Notice and Provided to the Control of the Control o	olkswagen AG does not gua	Cepredia	• 2 DCY	- Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.11 Engine Coolant Temperature Sensor G62, Checking", page 226 .
P0121 Throt- tle/ Pedal Posi- tion Sen- sof/ Switc h "A" Circuit Rang e/ Per- for- manc e	Throttle/Pedal Position Sensor/Switch "A" Circuit Range/Performance	• Signal voltage > 1.0 V and/or < 0.4 V	 ECT > -19.94° C and/or < 120° C Battery voltage > 10.0 V 	• 200.0 ms	On the correctness of information in t	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270 .
P0122 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "A" Circuit Low	Throttle/ Pedal Position Sensor/ Switch "A" Cir- cuit Low	4.85 V வைவி	DA Nagen AG.	480.0 ms	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270 .
P0123 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "A" Circuit High	Throttle/ Pedal Position Sensor/ Switch "A" Cir- cuit High	Signal voltage < 150.0 mV		• 480.0 ms	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0128 Cool- ant Ther- mo- stat (Cool- ant Tem- pera- ture Below Ther- mo- stat Regu- lating Tem- pera- ture)	Thermo- stat Tem- perature Below Control Range	Measured temperature < 70° C Modeled temperature > 80° C	 ECT at start < 59.96° C and/or > -10.4° C Engine speed > 500 RPM Testing time < 900.0 s ECT = no fault IAT = no fault VSS = no fault Model release conditions: Increase of ECT > 3 K Time since release conditions are met > 300.0 s Restart condition: ECT drops after io thermostat test below < 59.96° C 	900.0 s (if re- start condi- tions are met) Contin- uous	• 2 DCY	 Check the engine coolant thermostat. Refer to appropriate repair manual. Check the Engine Coolant Temperature Sensor - G62 Refer to ⇒ "3.6.11 Engine Coolant Temperature Sensor G62, Checking", page 226 . Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.12 Engine Coolant Temperature Sensor Colant Sensor Colant Sensor Colant Sensor Colant Sensor Colan
O2 Sen- sor Circuit Bank 1 Sen- sor 1	H Whole, isne	• Virtual ground (VM) > 3.0 V	HO2 heater temperature > 720° C Battery voltage > (exhaust gas flow, exhaust gas temperature at sensor element) Pod Sylvania Sylvania	2.0 sContinuous	• C2 DCY	On Radiator Outlet G83 Checking". page 228. - Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to 3.6.29 Oxygen Sensor 1 Before Catalytic Converter GX10 Refer to Checking".
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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure	
O2 Sen- sor	O2 Sen- sor Cir- cuit High Voltage Bank 1 Sensor 1	• Signal voltage > 3.2 V	 HO2 heater = active Modeled dew point = exceeded HO2 heater temp between > 720° C and/or < 840° C Battery voltage > 10.7 V 	 2.0 s Continuous 	• 2 DCY	- Check the Oxygen Sensor 1 Before Cata- lytic Con- verter - GX10 Re- fer to ⇒ "3.6.29 Oxygen Sensor 1 AG Before Cata- lytic Con- verter GX10, Checking", page 264	Tacres
O2 Sen- sor	O2 Sen- sor Cir- cuit Slow Re- sponse Bank 1 Sensor 1	 Time to 30.0% of expected concentration increase > 2.6 s Or Time to 60.0% minus time to 30.0% > 1.5 s Or Time to 60.0% of expected concentration increase > 4.1 s 	 Heater control and fuel cutoff = active Fuel quantity before transition to fuel cutoff > 6.0 mg/stroke Change in fuel quantity before transition to fuel cutoff over period of 1.0 s < 2.0 mg/stroke Calculated oxygen concentration before transition < 12.0% vol yol Duration of transition to fuel cutoff < 1.1 s Battery voltage > 10.7 V Engine speed > 1,400 RPM Duration of transition plus duration of fuel cutoff > 4.1 s 2 fuel cutoff phases: (each of duration > 4.1 s) that satisfy enable conditions. 	• 8.5 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.29 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 264.	
P0135 O2 Sen- sor Heat-	O2 Sensor Heater Circuit Bank 1 Sensor 1	HO2S ceramic temp. > 840° C	 No fuel cut off > 0.1 s Dew point = exceeded 	• 30.0 s • Continuous	• 2 DCY	Check the Oxygen Sensor 1 Before Catalytic Con-	



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
er Cir- cuit Bank 1 Sen-		HO2S ceramic temp. < 720° C	Calibration of internal resist- ance = not ac- tive	• 60.0 s • Continuous		verter - GX10 Re- fer to ⇒ "3.6.29 Oxygen
sor 1	Short To Battery voltage	Signal current > 2.2 A	Heater control closed loop	• 5.0 s • Continuous		Sensor 1 Before Cata- lytic Con-
	Short To Ground	• Signal voltage < 2.15 V				verter GX10 , Checking", page 264 .
	Open	• Signal voltage > 4.4 V				
P0136 O2 Sen- sor Circuit Bank 1 Sen- sor 2	O2 Sen- sor Cir- cuit Bank 1 Sensor 2 Short To Ground	 Virtual ground (VM) > 3.0 V Nernst voltage (UN) > 4.0 V Adjustment voltage (IP) > 1.5 V Virtual ground (VM) < 2.0 V Nernst voltage (UN) < 1.75 V Adjustment voltage (IP) < 0.3 V 	Sensor element temperature 720° C Battery voltage exhaust gas flow, exhaust gas temperature at sensor element	• Continuous	\$₩ag 2 r DCY _{oes}	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7 Checking", page 261
	Dynamic Check Virtual Ground (VM) Dynamic Check Nernst Voltage (UN)	 Virtual ground (VM) internal resistance > 1,104.0 Ω Internal signal voltage < 1.4 V and/or > 1.6 V 	HO2 Sensor Heater temper- ature > 720° C Battery voltage = exhaust gas flow, exhaust gas tempera- ture at sensor element Calculated oxy- gen concentra	• 4.0 s • Continuous	.ĐA n∋gsw _e	MOV WOTH BINGO THOM WOLLD WON
	Dynamic Check Pump Current (IP)	• Pump current (IP) < 0.005 [-]	 Calculated oxygen concentration > 0.07 [-] Fuel cutoff = not active Battery voltage > 10.7 V 	 Continuous 	3.	

	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Sen- sor N Circuit High Volt- age Bank 1 Sen- sor 2	sor Cir- cuit High Voltage Bank 1 Sensor 2	• Signal voltage > 3.2 V	 HO2 heater = active Modeled dew point = exceeded HO2 heater temp between > 720° C and/or < 840° C Battery voltage > 10.7 V 			- Check the Oxygen Sensor 1 Af- ter Catalytic Converter - GX7- Refer to ⇒ "3.6.28 Oxygen Sensor 1 Af- ter Catalytic Converter GX7 Checking", page 261
Sen- sor F Circuit s Slow E	sor Cir- cuit Slow Re-	 Time to 30.0% of expected concentration increase > 2.6 s Or Time to 60.0% minus time to 30.0% > 1.5 s Or Time to 60.0% of expected concentration increase > 2.6 s 	 Heater control and fuel cutoff = active Fuel quantity before transition to fuel cutoff > 6 mg/stroke Change in fuel quantity before transition to fuel cutoff over period of 1.0 s < 2.0 mg/stroke Calculated oxygen concentration before transition < 12.0% vol / vol Duration of transition to fuel cutoff < 1.1 s Battery voltage > 10.7 V Engine speed > 1,400 RPM Duration of transition plus duration of fuel cutoff > 4.1 s 2 fuel cutoff phases: (each of duration > 4.1 s) that satisfy enable conditions 	• 8.5 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7 Checking Page 261.



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure	
B O2 Sen- sor Slow Re-	O2 Sen- sor Slow Re- sponse - Lean To Rich Bank 1 Sensor 2	 Time delay between oxygen signals pre and post NOx trap > 1.5 s (1. sensor later than 2. sensor) Time delay between oxygen signals pre and post NOx trap > 0.45 - 0.72 s = (exhaust gas mass flow) (2. sensor later than 1. sensor) 	 Demand for NOx trap = on Adaptation of oxygen sensor pre and post NOx trap = realized Dew point release oxygen sensor signals pre and post NOx trap = on Oxygen sensor signals pre and post NOx-trap < 1.1 [-] Torque (LP on) off: < 60.0 Nm 	45.0 mins (3 regeneration events)	• 2DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 261.	
			(1,000 – 2,000 RPM) 25.0 Nm (2,250 – 2,500 RPM) 65.0 Nm (2,800 RPM) on: > 80.0 Nm (1,100 – 2,500 RPM) 45.0 Nm (2,700 RPM) in dependence of environmental pressure (750.0 – 1,000.0 hPa off: < 160.0 – 270.0 Nm (1,000 – 1,500 RPM) 300 Nm (1,750 – 2,500 RPM) 300 Nm (1,750 – 2,500 RPM) 295.0 Nm (2,800 RPM) 295.0 Nm (2,700 RPM) 320.0 Nm (1,750 – 2,500 RPM) 295.0 Nm (2,700 RPM) in dependence of environmental pressure (750 – 1,000.0 hPa), shown values taken at 1,000.0 hPa • Temperature of upstream turbine < 850° C	Nolkswagen A	. DA	G does not guarantes or a	ccest and liability with respect to the correctness of information in this occurrence.

		cs"		90		
DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi-	Component Diagnostic Procedure
P0141 O2 Sen- sor Heat- er Cir- cuit Bank	O2 Sensor Heater Circuit Bank 1 Sensor 2	HO2S ceramic temp. > 840° C HO2S ceramic temp. < 720° C	 Fuel temp < 90° C APP > 1 and < 100.0% Gear = 2 Engine run time > 240.0 s Exhaust gas flow > 100.0 and < 200.0 kg/h No fuel cut off > 0.1 s Dew point = exceeded Calibration of internal resist- 	• 30.0 s • Continuous • 60.0 s	with respect to the correctness of information CY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.28
1 Sen- sor 2	Short To Battery voltage Short To Ground	Signal current > 2.2 A Signal voltage < 2.15 V	ance = not ac _m s tive S∀ Use tive S∀ Use S	5.0 s Continuous		Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 261.
	Open	• Signal voltage > 4.4 V				



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
D O2 Sen- sor Circuit	Bank 1 Sensor 1	 Time delay between oxygen signals pre and post NOx trap > 1.5 s (1. sensor later than 2. sensor Time delay between oxygen signals pre and post NOx trap > 0.45 - 0.72 s = (exhaust gas mass flow) (2. sensor later than 1. sensor) 	 Demand for NOx trap = on Adaptation of oxygen sensor pre and post NOx trap = realized Dew point release oxygen sensor signals pre and post NOx trap = on Oxygen sensor signals pre and post NOx-trap < 1.1 [-] 	45.0 mins. (3.0 regeneration events)	• 2 DCY	- Check the Oxygen Sensor 1 Before Cata- lytic Con- verter - GX10 Re- fer to ⇒ "3.6.29 Oxygen Sensor 1 Before Cata- lytic Con- verter GX10, Checking", page 264 .
		in bart or in whole, is not be mile of the man of the mile of the	pre and post NOx trap = on Oxygen sensor signals pre and post NOx-trap < 1.1 [-] Torque (LP on) off: < 60.0 Nm (1,000 – 2,000 RPM) 25.0 Nm (2,250 – 2,500 RPM) 65.0 Nm (2,800 RPM) on: > 80.0 Nm (1,100 – 2,000 RPM) 45.0 Nm (2,700 RPM) in dependence of environmental pressure (750.0 – 1,000.0 hPa), shown values taken at 1,000.0 hPa off: < 160.0 – 270.0 Nm (1,000 – 1,500 RPM) 300 Nm (1,750 – 2,500 RPM) 265.0 Nm (2,800 RPM) On: > 200.0 – 290.0 Nm (1,100 – 1,500 RPM) 320.0 Nm (1,750 – 2,500 RPM) 295.0 Nm (2,700 RPM) in dependence of environmental pressure (750 – 1,000.0 hPa), shown values taken at 1,000.0 hPa Temperature of upstream turbine < 850° C			Cotacoptam liability with respect to the corrections of information in this operation to the corrections of the correction of the corrections of the cor

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Tem-	Fuel Tempera- ture Sen- sor Cir- cuit Range / Perform- ance	Temperature difference to at least 3 other temperature sensors at startup > 30 K	 Fuel temp < 90° C APP > 1 and < 100.0% Gear = 2 Engine run time > 240.0 s Exhaust gas flow > 100.0 and < 200.0 kg/h Engine off time > 9.0 hr IAT change after engine start < 5 K ECT sensor 1 or 2 < 30° C Decrease of coolant temperature 1 or 2 after engine start < 5 K 	• 60.0 s including 20.0 s continuous driving with velocity exceeding 25 mph	• 2 DCY	- Check the Fuel Tem- perature Sensor - G81- Refer to ⇒ "3.6.23 Fuel Tem- perature Sensor G81, Checking", page 251.
Tem-	Fuel Temperature Sen-Mulino part ture Sen-Mulino part Count Short To Ground Gro	Signal voltage < 0.05 V		• 480.0 ms	Once / DCY • 2 DCY	- Check the Fuel Temperature Sensor - G81- Refer to ⇒ "3.6.23 Fuel Temperature Sensor G81, Checking", page 251
pera- ture Sen- sor "A"	Fuel Tempera- ture Sen- sor Cir- cuit Open Or Short To Bat- tery Volt	• Signal voltage > 4.7 V		• 480.0 ms • Once / DCY	• 2 DCY	Chook the



	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
oommercial purposes, in part or in whole, is not been.	Rail Pres- sure Sen- sor Circuit Rang e/	Pressure Sensor Circuit Offset Detection During	• Signal voltage < 0.409 V or > 0.620 V	Engine condition: ignition off, engine off, ECM still on	• 100.0 ms	• 2 DCY	- Check the Fuel Pressure Sensor - G247 Refer to ⇒ "3.6.21 Fuel Pressure Sensor G247, Checking",
		/ F3/631 / A	Adaptation value out of limit > 130.0% or < 83.0% Wagen AG. Volkswagen AG.	pressure set point < 800.0 bar/s	• < 80.0 s		<u>page 246</u> .
	P0192 Fuel Rail Pres- sure Sen- sor Circuit Low Bank 1	Fuel Pressure Sensor Circuit Short To Ground	Signal voltage < 200.0 mV		140.0 ms Continuous continuous	• 2 DCY	- Check the Fuel Pressure Sensor - G247 - Refer to ⇒ "3.6.21 Fuel Pressure Sensor G247, Checking", page 246 .
Mooroan	Pres- sure Sen-	Short To Battery Voltage	• Signal voltage > 4.8 V	• Injector valve =	• 40.0 ms Contin- uous	• 2 DCY • y	- Check Fuel Pressure Sensor - G247 Refer to ⇒ "3.6.21 Fuel Pressure Sensor G247 . Checking", page 246 .
	P0201 Cylin- der 1 Injec- tor "A" Circuit	Cylinder 1 Injector Circuit Open	• Signal voltage > 60.0 V	Injector valve = switched on	4 [in- jec- tions]Contin- uous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240 .

DTC / Monitor De- Strategy scription tion	and Threshold Val-	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0202 Cylinder Cylin- der 2 Injec- tor "A" Circuit	• Signal voltage > 60.0 V	Injector valve = switched on	4 [in-jec-tions] Contin-uous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240 .
P0203 Cylinder Cylin- der 3 Injecto Circuit Open Circuit	• Signal voltage > 60.0 V	• Injector valve = switched on	• 4 [in- jec- tions] swa@ontin- uous do	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240
P0204 Cylin- der 4 Injec- tor "A" Circuit	• Signal voltage > 60.0 V	Injector valve = switched on	4 [in- jec- tions]Contin- uous	• 2 DCY	- Check the Euel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240
P020 A Cylinder 1 Injec- tion Tim- ing	Control error < limit from MAP (engine speed and desired torque) -8° CA to -4° CA Control error < limit from MAP (engine speed and desired torque) and desired torque.	 Engine running ECM in closed loop ECT > 50° C Baro > 750.0 hPa Time since engine start > 30.0 s Regeneration = off 	• 120 rev		- Check Fuel Injectors. Refer to \$\(^*\) *3.6.18 Fuel Injectors, Checking", page 240 . - Check Camshaft Position Sensor G40- Refer to \$\(^*\) *3.6.3 Camshaft Position Sensor G40, Checking", page 209 - Check Engine Speed Sensor - G28 Refer to \$\(^*\) *3.6.13 Engine Speed Sensor G28, \$\(^*\)



DTC / De-	Monitor Strategy	Malfunction Criteria and Threshold Val-	Secondary Parameters with Enable	Monitoring MIL Illumi- Time nation	Component Diagnostic Proce-
scrip- tion	Descrip- tion	ue	Conditions	Length	dure
der 2 Injection tion Tim-ing ing		Control error < limit from MAP (engine speed and desired torque) -8° CA to -4° CA Control error < limit from MAP (engine speed and desired torque) +8° CA to +4° CA Control error < limit from MAP (engine speed and desired torque) +8° CA to +4° CA	 Engine running ECM in closed loop ECT > 50° C Baro > 750.0 hPa Time since engine start > 30.0 s Regeneration = off 	• 120 rev • 2 Imrespect to the correctness of information in the correctne	- Check Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240 . - Check Camshaft Position Sensor - G40- Refer to ⇒ "3.6.3 Camshaft Position Sensor G40, Checking", page 209 - Check Engine Speed Sensor - G28 Refer to ⇒ "3.6.13 Engine Speed Sensor - G28 Refer to ⇒ "3.6.13 Engine Speed Sensor - G28 Refer to ⇒ "6.6.13 Engine Speed Sensor - G28 Refer - Sensor

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P020 C Cylin- der 3 Injec- tion Tim- ing	Cylinder 3 Injec- tion Tim- ing	Control error < limit from MAP (engine speed and desired torque) -8° CA to -4° CA Or	 Engine running ECM in closed loop ECT > 50° C Baro > 750.0 hPa 	• 120 rev	• 2 DCY	- Check Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240 .
		Control error < limit from MAP (engine speed and desired torque) +8° CA to +4° CA Control error < limit from MAP (engine speed and desired torque) +8° CA	 Time since engine start > 30.0 s Regeneration = off 			- Check Camshaft Position Sensor - G40- Refer to ⇒ "3.6.3 Camshaft Position Sensor G40, Checking", page 209
		ses, in part or in whole is not be with the same same as the same	orised by Volkswagen AG. V	olkswagen AG o	oes not guarantes	- Check Engine Speed Sensor - G28 Refer to **3.6.13** Engine Speed Sensor G28 . Checking", page 230 .
		ophinate of commercial purposes, in part or in who	Protected by copyright,	.ĐA nag	ременю Лудибил	Dage 230 . pect to the correctness of information in this contraction in this contraction in the correctness of information in this contraction in this contraction in the correctness of information in this contraction in the correctness of information in the correctness of info



DTC /	Monitor	Malfunction Criteria	Secondary Param-	Monitoring	MIL Illumi-	Component Di-
De- scrip- tion	Strategy Descrip- tion	and Threshold Val- ue	eters with Enable Conditions	Time Length	nation	agnostic Proce- dure
P020 D Cylin- der 4 Injec- tion Tim- ing	Cylinder 4 Injection Tim- ing	Control error limit from MAP (engine speed and desired torque) -8° CA to -4° CA Or Control error < limit from MAP (engine speed and desired torque) +8° CA to +4° CA CA CA CONTROL ERROR CA	Engine running ECM in closed loop ECT > 50° C Baro > 750.0 hPa Time since engine start > 30.0 s Regeneration = off	• 120 rev		- Check Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240 Check Camporrection Sensor G40- Refer to ⇒ "3.6.3 Camshaft Position Sensor G40 Checking", page 209 Check Encline Speed
P0234 Tur- bo- charg- er/ Su- per- charg- er "A" Over- boost Con- dition	Charge Air Boost Pressure Rationali- ty Check Low	Absolute value of control deviation > -300.0800.0 hPa	 Engine running Time after start > 96.0 s 	 7.0 s Continuous 	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9. Checking", page 255. - Check the Wastegate Bypass Regulator Valve - N75 Refer to ⇒ "3.6.34 Wastegate Bypass Regulator Valve N75. Checking", page 274.

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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0236 Manifold Absolute Pressure/ Barometric Pressure Sen-	Charge Air Pres- sure Sen- sor Cir- cuit Plau- sibility Check	Difference be- tween barometric and boost pres- sure signal > 150.0 hPa	 Engine speed < 50 RPM Baro/MAP = no faults Ambient pressure signal = no fault 	• 540.0 ms	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9, Checking", page 255 .
sor Circuit Rang e/ Per- for- manc e		akswagen A	G.Volkswagen AG does n.			- Check the Wastegate Bypass Reg- ulator Valve - N75 Re- fer to ⇒ "3.6.34 Wastegate Bypass Reg- ulator Valve N75 . Checking", page 274 .
Circuit	cuit Short To Ground	• Signal Voltage < Que de la constant de la constan	Engine running	©U≈480.0 ms _{oofgcg}	2 DCY 2 DCY 2 DCY 2 DCY 2 dany liability with respect to the correctness of information in this country in the correctness of information	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9. Checking", page 255 . - Check the Wastegate Bypass Regulator Valve - N75 Refer to ⇒ "3.6.34 Wastegate Bypass Regulator Valve N75. Checking", page 274 .
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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0238 Tur- bo- charg- er/ Su- per- charg- er Boost Sen- sor "A" Circuit High	Air Pressure Sensor Circuit Open Or Short To Battery Voltage	Signal voltage > 4.88 V	Engine running	• 480.0 ms	• 2 DCY	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9. Checking", page 255. - Check the Wastegate Bypass Regulator Valve - N75 Refer to ⇒ "3.6.34 Wastegate Bypass Regulator Valve N75., Checking", page 274.



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Cylin- der 1 Con- tribu- tion/ Bal- ance	Cylinder 1 Zero Fuel Calibration (Monitor-ing Of Zero Fuel Calibration Values) South of the Calibration Values of Calibration Values	• Calibration value of injector energizing time > 217 us or < 117 us (at 1,400.0 bar rail pressure)	 Enable conditions for adaption: Engine speed > 1,050 RPM or < 2,000 RPM (1,400 RPM) 	Adaption: ≤ 2.0 Country Countr	1 DCY Ceed and liability with respect to the correctness of information in this cook to the correctness of the corre	 Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Automatic Glow Time Control Module - J179 - Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Automatic Glow Time Control Module - J179 - Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Fuel Injectomatic Glow Time Control Module J179 and Glow Plug, Checking", page 205 Check the Fuel Injectors . Refer to appropriate repair manual for low compression readings or for carbon buildup removal.

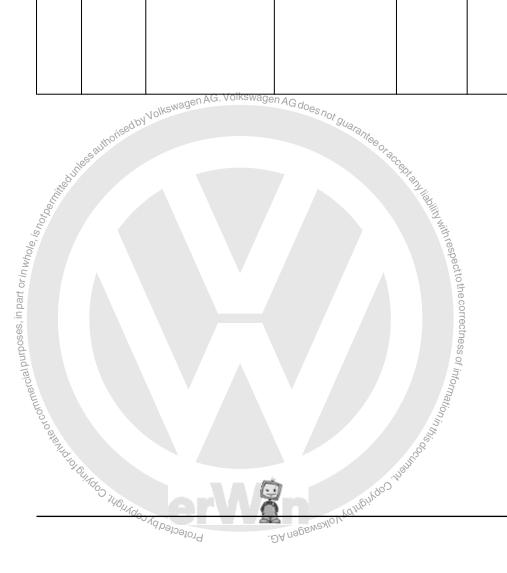


	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
in whole, is:	Cylinder 2 Contribution/ Balance	Cylinder 2 Zero Fuel Calibration (Monitoring Of Zero Fuel Calibration Values)	• Calibration value of injector energizing time > 217 μs or < 117 μs (at 1,400.0 bar rail pressure)	 Enable conditions for adaption: Engine speed > 1,050 RPM or < 2,000 RPM (1,400 RPM with 6 Gear MT) Fuel temperature > 0° C or < 80° C Intake air temp > 0° C ECT > 70° C Boost pressure > 880.0 hpa Gear 3, 4, 5 or 6th Engine condition; fuel cutoff and inactive regeneration Absolute value of rail pressure deviation < 50.0 bar (set point = 1,400.0 bar) 	Adaption: ≤ 2.0 UDC cycles Continuous Coptamiliability with respect to the correctness of information in this could be a continuous. Coptamiliability with respect to the correctness of information in this could be a continuous.	• 1 DCY	 Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the Automatic Glow Time Control Module - J179 - Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205 . Check the Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors . Checking", page 240 .
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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0269 Cylin- der 3 Con-	Cylinder 3 Zero Fuel Cali- bration (Monitor- ing Of Zero Fuel Calibra- tion Val- ues)	• Calibration value of injector energizing time > 217 µs or < 117µs (at 1,400.0 bar rail pressure).	 Enable conditions for adaption: Engine speed > 1,050 RPM or < 2,000 RPM (1,400 RPM with 6 Gear MT) Fuel temperature > 0° C or < 80° C Intake air temp > 0° C ECT > 70° C Boost pressure > 880.0 hpa Gear 3, 4, 5 or 6th Engine condition: fuel cutoff and inactive regeneration Absolute value of rail pressure deviation < 50.0 bar (set point = 1,400.0 bar) 			Check the Fuel Injectors . Refer to \$\infty\$ "3.6.18 Fuel Injectors , Checking", page
	TIMO TO	See And To Bundo And	Datord Datored	бем яди Лоцкем в д	Koo in the life of	



DTC / Monitor De- scrip- tion Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P026 A Charge e Air Cool- er Efficien- cy Be- low Thres hold Charge Air Cool- er Efficiency Below Threshold	Charge air inter- cooler efficiency < 0.4 [-]	 ECT > 60° C Vehicle speed > 40 MPH Boost pressure vs. barometric > 1.0 hPa Charge air flow rate > 60.0 and/or < 400.0 kg/h Ambient temp > -7° C and/or < 50° C Baro > 750.0 hPa Fuel quantity > 1.0 mg/stroke Gear = not reverse 	• 245.0 s • Once / DCY	• 2 DCY	 Check the air to air intercooler in front of the radiator for debris obstructing the cooling fins, restricted or collapsed hoses, damaged or missing lower fascia or splash shield. Correct the condition and clear the DTC. Test drive vehicle. Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9, Checking", page 255 .





DTC / Mor De- Strat scrip- Desc tion tic	tegy crip-	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0272 Cylin- Cylin- Cylin- der 4 Con- tribu- tion/ Bal- ance Calib tion \ ues)	der To Cali- on iitor- of Fuel ora- /al-	• Calibration value of injector energizing time > 217 µs or < 117 µs (at 1,400.0 bar rail pressure)	 Engine condition: fuel cutoff and inactive regeneration Absolute value of rail pressure deviation < 50.0 bar (set point = 1,400.0 bar) 		• 1 DCY	for carbon buildup removal. - Check the Automatic Glow Time Control Module J 179 - Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J 179 and Glow Plug, Checking", page 205 - Check the Fuel Injectors . Refer to
			Protected by	wagen AG.	NOIKE.	<u>ing", page</u> <u>240</u> .



	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
4	bo- charg- er/ Su- per- charg- er "A" Un-	Air Boost Pressure Rationali- ty Check High	Absolute value of control deviation > 400.0 – 800.0 hPa AG. Volkswagen AG. deviation > 400.0 hPa AG. Volkswagen AG. deviation 400.0 hPa AG. deviat	• Time after start > 96.0 s	• 7.5 s • Continuous	• 2 DCY	 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9. Checking", page 255. Check the Wastegate Bypass Regulator Valve - N75 Refer to ⇒ "3.6.34 Wastegate Bypass Regulator Valve N75. Checking", page 274.
orcommercial purposes, in part or in whole, is not being	Car Guission 7.	HEUNDOONG PORCE	agen AG. Volkswagen AG d	EMSHIO MARHOMADO THAIRDAN	olity with respect to the correctness of information in this		



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val-	Secondary Param- veters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0300 Random/ Multiple Cylinder Misfire De-der tected treduing the cylinder Misfire De-derivation and the cylinder Misfire De-derivatio	Misfire Detected Multiple Cylinder	Rise in engine speed after fuel injection: Calcu- lated based on values from last	Engine speed >	• <880	Once / DCY 2 DCY A liability with respect to the correctness of information in this co.	 Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 16 and/or to appropriate repair manual. Check the Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors . Checking", page 240 . Check the Engine Speed Sensor - G28 . Refer to ⇒ "3.6.13 Engine Speed Sensor G28 . Checking", page 230 .

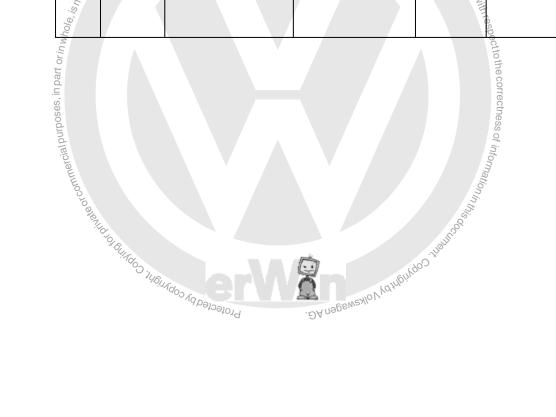


DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
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	or commercial purposes, in part or in w	Junes authorised by Volkswage	eters with Enable Conditions AG. Volkswagen AG does	SHOV VOIMBINGOS	₃ ct to the correctness of information in this oct.	

OTC / Monitor De- Strategy scrip- Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Cylinder 1 Misfire Detected Detected Vision of the Cylin of the Cylinder 1 Misfire Detected D	Misfire rate within 1,000 engine revolutions > 10.0% Misfire event detection if actual inner forque <	 Engine speed > 770 RPM Engine speed < 4,000 RPM Fuel quantity > 4.8 mg/stroke ECT, > -7° C ECT, < 120° C IAT, >-7° C Time since start > 5,000.0 ms Time since pos- 	• < 880 engine rev • Once / DCY	• 2 DCY	cause a higher than normal com- pression reading and may contrib- tute to this concern. Re- fer to appro-



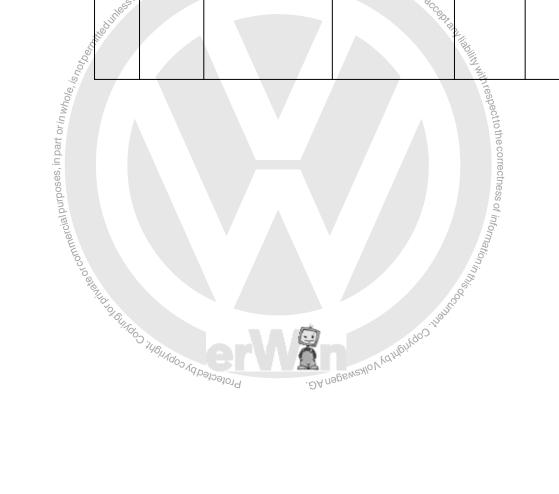
DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
hole, is not beginning	ad this sauthorise	d by Volkswagen AG. Volksw	agen AG does not guarante,	of accept any liability with the	- C-C-C-C-C-C-C-C-C-C-C-C-C-C-C-C-C-C-C	- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.3 Camshaft Position Sensor G40 , Checking", page 209 .



DTC / De-	Monitor Strategy	Malfunction Criteria and Threshold Val-	Secondary Parameters with Enable	Monitoring Time	MIL Illumi- nation	Component Diagnostic Proce-
scrip- tion	Descrip- tion	ue	Conditions	Length		dure
P0302 Cylinder 2 Misfire Detected	Cylinder 2 Misfire Detected	Misfire rate within 1,000 engine revolutions > 10.0% Misfire event detection if actual inner torque < 2.5 Nm Misfire actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection if actual inner torque < 2.5 Nm Misfire event detection in actual inner torque < 2.5 Nm Misfire event detection in actual inner torque < 2.5 Nm Misfire event detection in actual inner torque < 2.5 Nm Misfire event detection in actual inner torque < 2.5 Nm Misfire event detection in actual inner torque < 2.5 Nm Misfire event detection in actual inner torque < 2.5 Nm Misfire	Engine speed > 770 RPM Engine speed < 4,000 RPM Fuel quantity > 4.8 mg/stroke ECT, ≥ 27° C IAT, >-7° C Time since start > 5,000.0 ms Time since positive engine torque desire > 1,000.0 ms Desire inner torque > 45.0 Nm. Environmental pressure > 750.0 hPa. Macong papago pago pago pago pago pago pago p		• 2 DCY	may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in 3.1 Pre-



	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Marin.		housedpyNolk	_{sw} agen AG. Volkswagen AG	does not guarantee or accepta	Aliabilitywit		- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.3 Camshaft Position Sensor G40, Checking", page 209 .

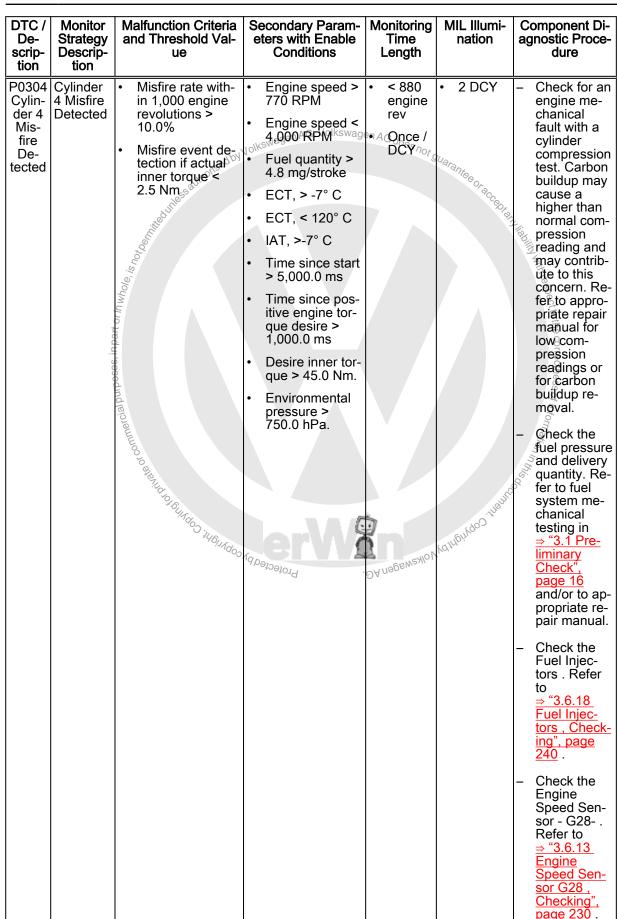


DTC / Monitor De- scrip- tion Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure	
P0303 Cylinder 3 Misfire Detected Detected	Misfire rate within 1,000 engine revolutions > 10.0% Misfire event detection if actual inner torque < 2.5 Nm	Engine speed > 770 RPM Engine speed < 4,000 RPM Fuel quantity > 4.8 mg/stroke ECT, > -7° C ECT, < 120° C IAT, >-7° C Time since start > 5,000.0 ms Time since positive engine torque desire > 4,000.0 ms Desire inner torque > 45.0 Nm. Environmental pressure > 750.0 hPa.			 Check for an engine mechanical fault with a cylinder compression test. Carbon buildup may cause a higher than normal compression reading and may contribute to this concern. Refer to appropriate repair manual for low compression readings or for carbon buildup removal. Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. Check the fuel lnjectors. Refer to and/or to appropriate repair manual. 	CE BORRING SERVICE SER

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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
						- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.3 Camshaft Position Sensor G40, Checking", page 209 .







DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Di- agnostic Proce- dure
		commercial purposes, in part or in who,				- Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.3 Camshaft Position Sensor G40 , Checking", page 209 .
P0321 Ignition/ Distributor Engine Speed Input Circuit Rang e/ Performanc e	Engine Speed In- put Cir- cuit Ra- tionality Check	 Consecutive not plausible signals > 15.0 [-] Cam phase signals without plausible signal > 4 cam rotations Monitoring reference gap = failure 	* Engine running time > 15.0 s	• 8 engine revs • Continuous	• 2 DCY	- Check the Engine Speed Sensor - G28 . Refer to ⇒ "3.6.13 Engine Speed Sensor G28 . Checking", page 230 . - Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.3 Camshaft Position Sensor G40 . Checking", page 209 .
P0322 Ignition/ Distributor Engine Speed Input Circuit No Signal	Engine Speed In- put Cir- cuit No Signal	 Camshaft signals > 3.0 [-] Crankshaft signals = no signal 	• Engine running time > 15.0 s	8 engine revs	• 2 DCY	- Check the Engine Speed Sensor - G28 Refer to ⇒ "3.6.13 Engine Speed Sensor G28, Checking", page 230. - Check the Camshaft Position Sensor - G40 Refer to ⇒ "3.6.3 Camshaft Position Sensor G40, Checking", page 209.

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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0381 Glow Plug/ Heat- er In- dica- tor Con- trol Cir- cuit/ Open	Glow Plug Control Indicator Lamp Circuit (Wait To Start)	Not equal with lamp request bits (via CAN) Not equal with lamp request bits (via CAN)	 Battery voltage > 9.0 V Glow system active 	• 350.0 ms • Continuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
			Politica State of Elixado Adol	Protorid	. DA nagen	- Check the Data Bus On Board Diagnostic Interpretation of the Data Bus On Board Diagnostic Interpretation of the Data Bus On Bu
P0383 Glow Plug Con- trol Mod- ule 1 Con- trol Circuit Low	Glow Plug Time Control Module Control Circuit Short To Ground	Signal voltage < 200.0 mV	Glow system = not active	• 500.0 ms • Continuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P0401 EGR "A" Flow Insuf- ficient De- tected	EGR System Rationali- ty Check Low Flow Detected	• Control deviation: EGR < -45.0 – -200.0 g/rev	 EGR mode closed loop Fuel quantity > 2.0 or < 30.0 mg Engine speed > 800 or < 3,100 RPM 	• 5.0 – 10.0 s	• 2 DCY	- Check the EGR Valve 1 - GX5 Refer to ⇒ "3.6.9 EGR Valve 1 GX5. Checking". page 222.
						EGR Valve 2 - GX6 Re- fer to ⇒ "3.6.10 EGR Valve 2 GX6 . Checking", page 224 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0402 EGR "A" Flow Ex- ces- sive De- tected	EGR System Rationali- ty Check Exces- sive Flow Detected	Mass air flow ratio calculated from: mass air flow measured vs. mass air flow modeled > 1.16 [-]	 Engine condition = running EGR mode closed loop Fuel quantity > 2.0 or < 30.0 mg Engine speed > 1,000 or < 2,600 RPM ECT 59.96° C Exhaust flap motor 100.50% and/or > 89.50% LP EGR > 99.50% Intake runner flap < 10.0% and/or > -1.0 % 	• 5.0 – 10.0 s • Contin- uous	• 2 DCY	- Check the EGR Valve 1 - GX5 Refer to ⇒ "3.6.9 EGR Valve 1 GX5, Checking", page 222 . - Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .
EGR "A" Con-	HP EGR Actuator Circuit Open	• Signal voltage > 0.8 V or < 2.0 V	ECM power stage = off	• 0.6 s	• 2 DCY	- Check the EGR Valve 1 - GX5 Re- fer to 0
trol Cir- cuit/ Open	HP EGR Actuator Circuit Short To Ground Or Mal- function Error HP EGR Actuator Circuit Short To	• Signal current > 8.0 A - 18.0 A	it edules sautron	ger 0.5 s √olks	wagen AG does i	- Check the EGR Valve 2 - GX6 Re-
	Battery Voltage HP EGR Actuator Circuit Function- al Check: Stuck Close	• Stuck valved 20.0%	• Control devia- tion > 10.0% or < -10.0%	• 3.0 s		fer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224.
	HP EGR Actuator Circuit Function- al Check: Stuck Open	• Stuck valve > 20.0%	ENITO O O THE INDO NA POR			MO V VO THE THOO STIPS THOUGH SE



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
EGR Sen- sor "A" Circuit	HP EGR Position Sensor Circuit Short To Ground	• Signal voltage <	 Position sensor signal > 4,850.0 mV Position sensor signal < 150.0 mV 	• 0.5 s	• 2 DCY	- Check the EGR Valve 1 - GX5 Re- fer to ⇒ "3.6.9 EGR Valve 1 GX5 . Checking", page 222 .
Toposes, in part or In whole, is not be a with the control of the					spect to the correctness o	- Check the EGR Valve 2 - GX6 Re- fer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .
EGR Sen- sor "A" Circuit	HP EGR Position Sensor Circuit Short To Battery Voltage	• Signal voltage > 4.80 V	Position sensor signal > 4850 mV Position sensor signal < 150 mV	• 0.5 s	2 DCY	- Check the EGR Valve 1 - GX5 Refer to ⇒ "3.6.9 EGR Valve 1 GX5. Checking", page 222. - Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6. Checking", page 224.
P040 B EGR Tem- pera- ture Sen- sor "A" Circuit Rang e/ Per- for- manc e	Exhaust Gas Re- circula- tion Tem- perature Sensor Circuit Plausibili- ty Check	 Sensor temperature < 55° C Or Temperature difference to other temperature sensors during cold start < 45 K 	 Time engine running > 3.0 min ECT > 70° C Simulated sensor temp > 85° C Elapsed time since LP EGR valve open > 30.0 s Characteristic for heat flow balance of EGR LP cooler system exceeds lower threshold 	• 10.0 s	• 2 DCY	- Check the EGR Temperature Sensor - G98 Refer to ⇒ "3.6.8 EGR Temperature Sensor G98, Checking", page 220 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P040 C EGR Tem- pera- ture Sen- sor "A" Circuit Low	Exhaust Gas Re- circula- tion Tem- perature Sensor Circuit Short To Ground	Signal voltage < 0.06 V	Engine running	• 480.0 ms	• 2 DCY	- Check the EGR Temperature Sensor - G98 Refer to ⇒ "3.6.8 EGR Temperature Sensor G98, Checking", page 220 .
P040 D EGR Tem- pera- ture Sen- sor "A" Circuit High	Exhaust Gas Re- circula- tion Tem- perature Sensor Circuit Open Or Short To Battery Voltage	Signal voltage > 3.24 V	Engine running	• 10.0 min	• 2 DCY	- Check the EGR Temperature Sensor - G98- Refer to ⇒ "3.6.8 EGR Temperature Sensor G98, Checking", page 220 .
Catalyst System Efficiency Below Thres hold Bank 1		Ratio of measured and modeled heat quantity < 0.3 [-] Ratio of measured and modeled heat quantity < 0.3 [-] Ratio of measured and modeled heat quantity < 0.3 [-]	downstream oxidation catalyst > 50 K or < -50 K • Average HC injection during PM trap regeneration > 0.1 g/s • Accumulated HC injection mass > 50.0 g • Engine speed 1,250 – 4,000 RPM		• 1 DCY Varantee Oracle profile • 2 DCY Konufin do SY	- Check the Oxygen Sensor 1 after Catalytic Converter ox 3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7. Checking Check the Oxygen Sensor 1 Before Catalytic Converter ox 3.6.29 Oxygen Sensor 1 Sensor 1
P045 A EGR "B"	LP EGR Actuator Circuit Open Or	• Signal voltage > 0.8 V or < 2.0 V	• ECM power stage = off	• 0.0 s Continuous	· 2 DCY	Check the EGR Valve 2GX6 Refer to

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Con- trol Circuit	Malfunc- tion Error	• Signal current > 8.0 A – 18.0 A	ECM power stage = on	• 0.5 s • Continuous		⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224.
P045 B EGR "B" Control Circuit Rang e/ Performanc e	LP EGR Actuator Circuit Position Sensor Signal In Desired Range (Closed)	• Signal voltage > 1.0 V or < 0.4 V	 ECT > -19.94° C or < 120° C Battery voltage > 10.0 V 	• 200.0 ms	• 2 DCY	- Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .
P045 C EGR "B" Con- trol Circuit Low	LP EGR Actuator Circuits Short To Ground	Signal current > 8.0 A - 18.0 A	• ECM power stage on pen AG.	• Continuous	• 2 DCY does not guarante	- Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224
P045 D EGR "B" Con- trol Circuit High	LP EGR Actuator Circuits Short To Battery Voltage	• Signal current > 8.0 A \$18.0 A	ECM power stage = on	0.5 s Continuous	• 2 DCY	- Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6 . Checking", or page 224 . cgr
	LP EGR Position Sensor Circuit EGR Stuck Open	 Comparison of actual and desired position signal; EGR valve stuck (open) > 12.0% 	• Control deviation > 10.0% or < -10.0%	• 3.0 s	• 2 DCY	- Check the SEGR Valve 2 - GX6 Refer to ⇒ "3.6.10" EGR Valve 2 GX6. SCHOOL Checking", page 224 .
P045 F EGR "B" Con- trol Stuck Close d	LP EGR Position Sensor Circuit EGR Stuck Closed	 Comparison of actual and desired position signal: EGR valve stuck (closed) < 12.0% 	• Control deviation > 10.0% or 24,6,14,6,00,000,000,000,000,000,000,000,000,0	. 3.0 s	• 2 DCY	- Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .



	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
rin whole, is no.	C EGR Sen- sor "A" Circuit Rang e/	HP EGR Actuator Circuit Position Sensor Signal In Desired Range (Closed)	ewsSignal Voltage > 1.0 V or < 0.4 V	• ECT > -19.94° C or < 420° C • Battery voltage > 10.0 V	• 200.0 ms	• 2 DCY	- Check the EGR Valve 1 - GX5 Refer to ⇒ "3.6.9 EGR Valve 1 GX5 . Checking", page 222 .
onmercial purposes, in part or in whole, is,	TO STENIED !		Signal voltage > 4.9 V		the correctness of Information in this of the second secon	• 2 DCY	- Check the Differential Pressure Sensor - G505 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450 , Checking", page 236 .
	Ex- haust Pres- sure Sen- sor "A" Circuit Rang e/ Per- for- manc e		 Detection of false connected hose lines: Differential of pressure signal < -30.0 hPa Offset detection during after-run: Differential of pressure signal < -27.0 and/or > 47.0 hPa 	 ECT > 59.96° Control of the control of the	• 500.0 ms	2001	- Check the Differential Pressure Sensor - G505 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450 , Checking", page 236 .
	Ex-	Differen- tial Pres- sure Sen- sor Cir- cuit Short To Ground	Signal voltage < 0.2 V		• 480.0 ms	• 2 DCY	- Check the Differential Pressure Sensor - G505 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450, Checking", page 236 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Ex- haust	Differen- tial Pres- sure Sen- sor Cir- cuit Open Or Short To Bat- tery	• Signal voltage > 4.9 V		• 480.0 ms	• 2 DCY	- Check the Differential Pressure Sensor - G505 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450 . Checking", page 236 .
Ex- haust	Exhaust Pressure Sensors Circuit Detection Of A Dis- connec- ted	Difference be- tween modeled and actual pres- sure differential across low pres- sure EGR > 40 hPa	 ECT > 59.96 and/or < 149.96° C Ambient pressure > 780.0 hPa Filtered, simulated pressure down stream of particle filter > 40.0 hPa Exhaust flap motor < 78.0% 	• 5.0 s	• 2 DCY	- Check the Differential Pressure Sensor - G505 Refer to ⇒ "3.6.7 Differential Pressure Sensor G505, Checking", page 218 .
		es, in part or in whole, is not whole, is not whole is any whole is a full who is a second which who is a second which who is a second which which is a second which which is a second which which is a second whi	motor < 78.0% (closed) LP EGR valve > 84.0% (closed) Engine speed > 800 and/or < 3,500 RPM		CCC	- Check the Exhaust Pressure Sensor 1 - G450 Refer to ⇒ "3,6.16 Exhaust Pressure Sensor 1 G450 Checking", page 236 .
Ex- haust Pres- sure	Exhaust Door Control Unit Cir- cuit Open	• Signal voltage > 0.8 V or < 2.0 V	ECM power stage = off	• 0.6 s	• 2 DCY	- Check the Exhaust Door Control Unit - J883 Refer to
Con- trol Valve "A"	Exhaust Door Control Unit Cir- cuit Mal- function Error	Signal current > 8.0 A - 18.0 A Signal current > 7.0 A Signal current > 7.0 A	ECM power stage = on	• 0.5 s	wando Jul	⇒ 3.6.14 Exhaust Door Control Unit J883, Checking", page 232.
P0477 Ex- haust Pres- sure Con- trol Valve "A" Low	Exhaust Door Control Unit Cir- cuit Short To Ground	• Signal current > 8.0 A – 18.0 A	ெECM power stage = on	e 2.0 - Reams and a second and a second	or 2 DCY	- Check the Exhaust Door Control Unit - J883 Refer to ⇒ "3.6.14 Exhaust Door Control Unit J883, Checking", page 232.

	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- swagen AG. Ve lkswagen AG	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Whole, is hotbers.	Ex- haust	Exhaust Door Control Unit Cir- cuit Short To Bat- tery Volt- age	• Signal current > 8.0 A – 18.0 A	ECM power stage = on control devia-	• O.5 S	• 2 DCY	- Check the Exhaust Door Control Unit - J883 Refer to ⇒ "3.6.14 Exhaust Door Control Unit J883. Checking", page 232.
or commercial purposes, in part or in whole, is hotbes	P047 F Ex- haust Pres- sure Con- trol Valve "A" Stuck Open	Exhaust Door Control Unit Cir- cuit Stuck Open	Exhaust door flap stuck open < 10.0%	• Control deviation < -10.0%	whe correctness of information in the second	• 2 DCY	- Check the Exhaust Door Control Unit - J883 Refer to ⇒ "3.6.14 Exhaust Door Control Unit J883 . Checking", page 232 .
	EGR Sen- sor "B"		• Signal voltage > 4.7 V • Signal voltage < ○ ○○○○0.21 V	Oophily Mary Volkewage	480.0 ms	• 2 DCY	- Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .
	P048 A Ex- haust Pres- sure Con- trol Valve "A" Stuck Close d	Exhaust Door Control Unit Cir- cuit Stuck Closed	Exhaust door flap stuck closed > 10.0%	Control deviation > 10.0%	• 33.0 s	• 2 DCY	- Check the Exhaust Door Control Unit - J883 Refer to ⇒ "3.6.14 Exhaust Door Control Unit J883, Checking", page 232.

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P048 B Ex- haust Pres- sure Con- trol Valve "A" Posi- tion Sen- sor/ Switc h Cir- cuit	Exhaust Flap Po- sition Sensor Circuit Short To Ground	• Signal voltage < 0.25 V		• 0.5 s	• 2 DCY	- Check the Exhaust Flap Control Module - J883 Refer to ⇒ "3.6.14 Exhaust Door Control Unit J883, Checking", page 232 .
P048 C Ex- haust Pres- sure Con- trol Valve "A" Posi- tion Sen- sor/ Switc h Cir- cuit Rang e/ Per- for- manc e	Exhaust Door Control Unit Cir- cuit Posi- tion Sen- sor Sig- nal In De- sired Range (Closed)	Position sensor signal in desired range during closed position learning > 1.1 V or < 0.5 V Signal voltage >	Coolant temperature > 49.96° C or < 120.0° Cv Battery voltage 10.0 V	• 200.0 ms	• 2 DCY	- Check the Exhaust Door Control Unit - J883 Refer to ⇒ "3.6.14 Exhaust Door Control Unit J883 , Checking", page 232 .
P048 E Ex- haust Pres- sure Con- trol Valve "A" Posi- tion Sen- sor/ Switc h Cir- cuit High	Exhaust Flap Po- sition Sensor Circuit Short To Battery Voltage	Signal voltage > 4.85 V	Protected by copyrigh,	• 0.5 s	· 2 DCY	- Check the Exhaust Flap Control Module - J883 Refer to 3.6.14 Exhaust Door Control Unit J883 Checking", page 232



P0501 Vehicle Vehi- cle Speed Sensor Speed Perform- ance Circuit Rang e/ Per- for- manc e P0502 Vehicle Vehi- Speed Vehicle Speed	Brake control unit error mes- sage sent		• 500.0 ms	• 2 DCY	- Check the vehicle speed signal. Refe ⇒ "3.6.33 Vehicle Speed Sinal, Check ing", page 272 .
for- manc e					- Check the
P0502 Vehicle Vehi- Speed					CAN-Bus terminal r sistance. Refer to ⇒ "3.6.4 CAN-Bus Terminal sistance, Checking page 211
cle Sensor Speed Circuit Sensor "A" Circuit Low Inpu	Brake control unit error message sent at agen AG. Volkswagen	AG do	• 500.0 ms	• 2 DCY	- Check the vehicle speed signal. Refe ⇒ "3.6.33 Vehicle Speed Sinal, Checking", page
a dilited the samo is ed by	Nolkswas	- Goes not guarantee of acce	A and liability with respect to		272 . - Check the CAN-Bus terminal r sistance. Refer to ⇒ "3.6.4 CAN-Bus Terminal sistance, Checking page 211
TO TO SHOULD THE STATE OF THE S	Brake control unit error message sent It Nolkswagen AG. Volkswagen Nolkswagen AG. Volkswagen Nolkswagen AG. Volkswagen	Sur Conniduration Volkewagen A	othe correctness of information in this obcurrence.		
-ADIAN doo	John Protected by (A NAGEWRAIO V KUTIDI.			

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Vehi- cle Speed Sen- sor "A" Circuit	Vehicle Speed Sensor Intermit- tent High Signal	Vehicle speed > 320 km/h AG. Volkswa	VSS signal not defective	• 500.0 ms	• 2 DCY	- Check the vehicle speed signal. Refer to ⇒ "3.6.33 Vehicle Speed Signal, Checking", page 272.
Errat- ic/ High	ames authorise	Boy Volkswagen AG. Volkswa	gualantee	or accepted Highlith Mith team		- Check the CAN-Bus terminal resistance. Refer to ⇒ "3.6.4 CAN-Bus Terminal Resistance, Checking", page 211.
P0506 Idle Con- trol Sys- tem RPM - Lower Than Ex- pec- ted	Idle Control System RPM Lower Than Expected	• Control deviation < 10.0%	 ECT sensor > -7.04° C and/or < 106.96° C Accelerator pedal position = 0.0 [-] 	• 25.0 s	2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270 .
Idle	Idle Con- trol Sys- tem RPM Higher Than Ex- pected	• Control deviation > 10.0%	• Engine running	• 25,0 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3- Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270.
P050 E Cold Start En- gine Ex- haust Tem- pera- ture Too Low	Cold Start En- gine Ex- haust Tempera- ture Too Low	Sensor tempera- ture < 170° C	 Ambient temperature > -20 °C Engine speed > 1,125 RPM Fuel quantity > 15.0 mg/stroke Model temperature > 230° C 	600.0 s accumulated time while comparison is active Once / DCY	• 2 DCY	 Check Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking", page 234 . Check the Exhaust Flap Control



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
		Control deviation limit from map (engine speed, torque)	CSERS = on temperature control loop = on (temp. upstream turbine > 200° C)	• 30.0 s	• 1 DCY	Module - J883 Refer to ⇒ "3.6.14 Exhaust Door Control Unit J883
			Temperature upstream partic- ulate matter trap > 100° C			Checking", page 232
		ihorised by Volkswagen AC	• fuel quantity > 10 mg/stroke and/or < 45 mg/r stroke • engine speed > 1100 rpm and/or < 3500	gu _{araniee}		
	illi dilli	salt	• engine speed > 1100 rpm and/or < 3500 rpm	OFACCAL	* an liabilities	
	n nwhole, is hot	s authorised by Volkswagen AC	 ECT > 25 °C and/or < 70 °C torque > 50 Nm and/or < 300 Nm 		ywith respect to	
- tac			 Gear > 2nd Ambient temperature > -20 °C 		And liability with respect to the correctness of inform	
	erciatou				s of inform	
A/C Re-	Vehicle Speed Sensor Intermit- tent / Er- ratic / High	• Signal voltage	Man and a series of the series	• 480.0 ms	• 2 DCY	- Check the vehicle speed signal. Refer to ⇒ "3.6.33 Vehicle Speed Signal, Checking", page 272.
Ex- haust Gas Tem- pera- ture Sen- sor	Exhaust Gas Tempera- ture Sen- sor Cir- cuit (Up- stream Turbo- charger) Open Or Short To Battery Voltage	• Signal voltage > 1.72 V	Engine running	• 480.0 ms	• 2 DCY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors , Checking", page 234 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Ex- haust Gas Tem- pera- ture Sen- sor Circuit Low Bank 1 Sen-	Exhaust Gas Tempera- ture Sen- sor Cir- cuit (Up- stream Turbo- charger) Short To Ground	Signal voltage < 0.45 V	Engine running O Volkswagen a	• 480.0 ms	• 2 DCY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors , Checking", page 234 .
sor 1 P054 E Idle Control System - Fuel Quantity Lower Than Ex- pected	Idle Control System Fuel Quantity Higher Than Expected Than Expected	Fuel quantity < 0.004 g/rev	 G. Volkswagen AG does not tion = running ECT > 55° C Vehicle speed < 1.0 MPH Engine speed > 750 RPM and/or < 1,500 RPM Accelerator pedal position = 0.0 [-] Ambient temperature > -10° C Ambient pressure > 750.0 hPa 	• Multipaple	2 DCY 2 DCY 3 dry liability with respect to the correctness of information in	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270 .
P054 F Idle Control System - Fuel Quantity Higher Than Ex- pected	trol Sys-	• Fuel quantity > 0.0182 - 0.0325 g/rev	 Engine condition = running ECT > 55° C Vehicle speed < 1.0 MPH Engine speed > 750 RPM and/or < 1,500 RPM Accelerator pedal position = 0.0 [-] Ambient temperature > -10° C Ambient pressure > 750.0 hPa 	• 10.0 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3. Checking", page 270 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0562 Sys- tem Volt- age Low	System Voltage Low Volt- age	Internal check failure of voltage supply for ECM off timer	Engine shut offPower on reset	• 6 DCY	• 1 DCY	- Check the Terminal 30 Power Supply Relay - J317 Refer to ⇒ "3.6.30 Terminal 30 Power Supply Relay J317, Checking", page 267 .
		messauthorised by Volkswage	_{≱n} AG. Volkswagen AG do _e	s not guarantee o	[†] CC _C O _D	- Check the powers and grounds to the Engine Control Module - J623 If all are ok, then replace the Engine Control Module - J623 Refer to appropriate repair manual.
P0604 Internal Control Module Random Access Memory (RAM) Error	Memory in part or in whole, is not in part or in whole, is not in part or in whole, is not in the part of in whole is not in the part of in t	 EEPROM could not be erased - data still available Write EEPROM not possible Checksum error in 3 or more locations 		• 1.0 s	• 22 Identity with respect to the concerness of Info	
P0605 Inter- nal Con- trol Mod- ule Mem- ory Check sum Error	ECM In- ternal Test Ér- ror	ECM internal self test failed Page 140 140 140 140 140 140 140 140 140 140	AdDA nagan	• 1.0 s • Continuous	• 2 DCY	 Replace the Engine Con- trol Module - J623 Refer to appropri- ate repair manual.
P0606 ECM/ PCM Pro- ces- sor	Internal Control Module Memory Check Sum Er- ror	ECM internal self test failed		• 1.0 s • Continuous	• 2 DCY	 Replace the Engine Con- trol Module - J623 Refer to appropri- ate repair manual.

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0607 Control Module Performanc	Control Module Perform- ance	ECM internal self test failed	LSU raw signal calibration = ac- tive	• 1.0 s	• 2 DCY	 Replace the Engine Con- trol Module - J623 Refer to appropri- ate repair manual.
Fuel Pump "A" Con- trol Cir- cuit/ Open	Pump Circuit Open	Signal current < 0.8 mA	Fuel pump commanded off	 270.0 – 480.0 ms Continuous 	• 2 DCY	- Check the Fuel Deliv- ery Unit - GX1- / Fuel Pump Relay - J17 Re- fer to ⇒ "3.6.17 Fuel Deliv- ery Unit GX1 / Fuel Pump Relay J17 , Check- ing", page 238 .
P0628 Fuel Pump "A" Con- trol Circuit Low	Fuel Pump Circuit Short To Ground	• Signal voltage < 2.0 V	Fuel pump commanded off united States united States States united States State	• 270.0 – 480.0 ms • Continuous	• 2 DCY	- Check the Fuel Deliv- ery Unit - GX1- / Fuel Pump Relay - J17 Re- fer to ⇒ "3.6.17 Fuel Deliv- ery Unit GX1 / Fuel Pump Relay J17, Check- ing", page 238
P0629 Fuel Pump "A" Con- trol Circuit High	Fuel Pump Circuit Short To Battery Voltage	Signal current > 1.0 A	Euel bamb commanded on Brue coin whole, is not part or in whole, is not part or in whole, is not part or in whole is not part or in which it is not part or in which is	 270.0 – 480.0 ms Continuous 	• 2 DCY	- Check the Fuel Deliv- ery Unit - GX1- / Fuel Pump Relay - J17 Re- fer to ⇒ "3.6.17 Fuel Deliv- ery Unit GX1 / Fuel Pump Relay J17 , Check- ing", page 238 .



scrip- D	Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
trol Te Mod- tu	CM In- ernal empera- ure Too ligh	Output driver temperature too high >150° C	Output driver = active	 480.0 ms Continuous 	• 2 DCY	- Check the Fuel Delivery Unit - GX1- / Fuel Pump Relay - J17 Refer to ⇒ "3.6.17 Fuel Delivery Unit GX1 / Fuel Pump Relay J17, Checking", page 238
Throt- Valle Ac- tulator Con- Montrol Ci	Control Motor Circuit In- ernal Er-	Diagnostic signal from actuator module = defec- tive state		• 2.5 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270 .
Sen- Re sor er Refer- Vo	Sensor Refer- nce Oltage A" Cir- uit Open	• Sensor supply voltage < 4.8 V or > 5.2 V or > 5.2 V	Volkswagen AG. Volkswag	90.0	• 2 DCY	- If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 Refer to appropriate repair manual.
C PI Glow Ti Plug Co Con- M trol Ci Mod- W ule 1 Ca	Glow Plug ime Control Module Circuit Vrong Calibra- on	Number of cylinders is unequal to ECU application or • Glow plug type is unequal to ECU application	• Glow system = active	1.0 sContinuous3.0 sContinuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule J179- Refer to 3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P0651 Sen- sor Refer- ence Volt- age "B" Cir- cuit/ Open	Sensor Refer- ence Voltage "B" Cir- cuit Open	Sensor supply voltage < 4.8 V or > 5.2 V Signal current >	swagen AG does not guara,	• 90.0 ms	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module J623 Refer to appropriate repair manual.
P066 A Cylin- der 1 Glow Plug Gon- trol Circuit Low	Plug Cyl- inder 1 Circuit Short To Battery Voltage	• Signal current > 70.0 A	 Glow system active Demand signal 8.0 – 95.0% Battery voltage > 9.0 V 	• Continuous	2 DCY 2 pect to the correctness of information in the correctness of infor	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P066 C Cylin- der 2 Glow Plug Con- trol Circuit Low	©low Plug Cyl- inder 2 Circuit Short To Battery Voltage	• Signal current > 70.0 A	 Glow system active Demand signal 8.0 – 95.0% Battery voltage 99.0 Venesion 	8.0 s Continuous uous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P066 E Cylin- der 3 Glow Plug Con- trol Circuit Low	Glow Plug Cyl- inder 3 Circuit Short To Battery Voltage	• Signal current > 70.0 A	 Glow system active Demand signal 8.0 – 95.0% Battery voltage > 9.0 V 	8.0 sContinuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIC Illumi- nation	Component Diagnostic Procedure	
P0670 Glow Plug Con- trol Mod- ule 1 Con- trol Cir- cuit/ Open	Glow Plug Time Module Control Circuit Open Or Short To Battery Voltage	boses, in part or in whole, is not ber	• Glow system = not active	• 500.0 ms • Continuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179- Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205	ity with respect to the correctness of information
der 1	Glow Plug Cyl- inder 1 Circuit Open Or Short To Ground	2.2 A	I • Glow system	• 8.0 s • Continuous	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 Refer to ⇒ "3.6.2 Automatic Glow Time Control Module 1179 and Glow Riog, Checking", page 205 .	sof information in the .
	Glow Plug Cyl- inder 2 Circuit Open Or Short To Ground	Signal current < 2.2 A	 Glow system active Demand signal 8.0 – 95.0% Battery voltage > 8.0 V 	• 8.0 s • Continuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205	
	Glow Plug Cyl- inder 3 Circuit Open Or Short To Ground	Signal current < 2.2 A	 Glow system active Demand signal 8.0 – 95.0% Battery voltage > 8.0 V 	8.0 s Continuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205	

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure	
P0674 Cylinder 4 Glow Plug Circuit/ Open	Glow Plug Cyl- inder 4 Circuit Open Or Short To Ground	Signal current < 2.2 A	 Glow system active Demand signal 8.0 – 95.0% Battery voltage > 8.0 V 	8.0 s Continuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .	
P067 A Cylin- der 4 Glow Plug Con- trol Circuit Low	Glow Plug Cyl- inder 4 Circuit Short To Battery Voltage	Signal current > 70.0 A	 Glow system active Demand signal 8.0 – 95.0% Battery voltage > 9.0 V 	8.0 s Continuous OVVolkswagen OVVolkswagen	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module 31.79 and Glow Plug, Check- ing", page 205	acceptanti
P0684 Glow Plug Con- trol	Glow Plug Time Control Module	Missing commu- nication from the Glow Control Unit	• EQT < 30° C	• 3.0 s • Continuous	• 2 DCY	 Check the Automatic Glow Time Control Mod- ule - J179 	lability with resp
trol Mod- ule 1 to PCM Com- muni- cation Circuit Rang e/ Per-	Circuit No PCM Commu- nication	Automatic Glow Time Control Module = Error Message	Glow system = active	• 50.0 s • Continuous		Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205. - Check the	accept and liability with response
for- manc e			ophiniste or commercial purposes, in	Protected by co	rg:	CAN-Bus terminal resistance. Refer to ⇒ "3.6.4 CAN-Bus Terminal Resistance," Checking".	In the last of the



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Relay	ance - Son Open To Early	• Internal test on AG. 1	Conditions telkswagen AG does not gu	• 10 times	2 DCY Manual Manual Respect to the department of the dep	- Check the Terminal 30 Power Supply Relay - J317 Refer to ⇒ "3.6.30 Terminal 30 Power Supply Relay J317, Checking", page 267 .
Relay De-	ECM Power Relay Perform- ance - Stuck	• Internal test		• 500.0 ms	• 2 DCY	- Check the Terminal 30 Power Supply Relay - J317 Refer to ⇒ "3.6.30 Terminal 30 Power Supply Relay J317 , Checking", page 267 .
P0697 Sen- sor Refer- ence Volt- age "C" Cir- cuit/ Open	Refer- ence	• Sensor supply voltage ≼3.168 V or > 3.432 V	N AOIKENISÕEU AG:	• 50.0 ms	• 2 DCY	 If a related sensor voltage code is also set, refer to that sensor for diagnosis first. If no other related codes set, replace the Engine Control Module - J623 Refer to appropriate repair manual.
P06A 3 Sen- sor Refer- ence Volt- age "D" Cir- cuit/ Open	Sensor Refer- ence Voltage "D" Cir- cuit/Open	Sensor supply voltage < 2.97 V or > 3.63 Vr		• 50.0 ms	• 2 DCY	 If a related sensor volt- age code is also set, re- fer to that sensor for diagnosis first. If no other related codes set, replace the Engine Con- trol Module - J623 Refer to appropri- ate repair manual.

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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P06B 9 Cylinder 1 Glow Plug Circuit Rang e/ Per- for- manc e	Glow Plug Cyl- inder 1 Resist- ance Check	 Glow plug resistance time interval after glow start: 4.0 – 9.0 s (< 0.3 Ω) 9.0 – 14.0 s (< 0.4 Ω) After 14.0 s (< 0.5 Ω) Anytime (> 1.2 Ω) 	Glow system active Demand signal 8.0 – 95.0% Battery voltage > 9.0 V	• 8.0 s • Continuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P06B A Cylin- der 2 Glow Plug Circuit Rang e/ Per- for- manc e	Glow Plug Cyl- inder 2 Resist- ance Check	 Glow plug resistance time interval after glow start: 4.0 – 9.0 s (< 0.3 Ω) 9.0 – 14.0 s (< 0.4 Ω) After 14.0 s (< 0.5 Ω) Anytime (> 1.2 Ω) 	Glow system active Demand signal 8.0 – 95.0% Battery voltage 9.0 V	8.0 s Continuous	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 - Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205 .
der 3 Glow	Glow Plug Cyl- inder 3 Resist- ance Check	 Glow plug resistance time interval after glow start: 4.0 – 9.0 s (< 0.3 Ω) 9.0 – 14.0 s (< 0.4 Ω) After 14.0 s (< 0.5 Ω) Anytime (> 1.2 Ω) 	 Glow system active Demand signal 8.0 – 95.0% Battery voltage > 9.0 V 	• 8.0 s • Continuous	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 - Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205 .
P06B C Cylin- der 4 Glow Plug Circuit Rang e/ Per- for- manc e	Glow Plug Cyl- inder 4 Resist- ance Check	 Glow plug resistance time interval after glow start: 4.0 – 9.0 s (< 0.3 Ω) 9.0 – 14.0 s (< 0.4 Ω) After 14.0 s (< 0.5 Ω) Anytime (> 1.2 Ω) 	 Glow system active Demand signal 8.0 – 95.0% Battery voltage > 9.0 V 	8.0 s Continuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P06C 5 Cylinder 1 Glow Plug Incorrect	Glow Plug Cyl- inder 1 Incorrect Type	Wrong current slope	 Glow system = active ECT < 18° C ECM off time >= 900.0 s Demand signal = 95.0% 	8.0 sContinuous	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205
P06C 6 Cylinder 2 Glow Plug Incorrect	Glow Plug Cyl- inder 2 Incorrect Type	Wrong current slope Reference to the slope Reference to the slope to the slo	Glow system = active ECT < 18° C ECM off time >= 900.0 s 900.0 s Demand signal = 95.0%	8.0 s Continuous AG does not gu	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205
P06C 7 Cylinder 3 Glow Plug Incorrect	Glow Plug Cyl- inder 3 Incorrect Type	• Wrong current slope	 Glow system = active ECT < 18° C ECM off time >= 900.0 s Demand signal = 95.0% 	• 8.0 s • Continuous	• 2 DCY	Check the Automatic Glow Time Control Mod- ule - J179- Refer to ⇒3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205
P06C 8 Cylin- der 4 Glow Plug Incor- rect	Glow Plug Cyl- inder 4 Incorrect Type	Wrong current slope	• Glow system = active • ECT < 18° C • ECM off time >= 900.0 s • Demand signal = 95.0%	8.0 s Continuous	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205

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DTC / De- scrip- tion	Strategy	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi-	Component Diagnostic Procedure
	Start Dies sel Intake Air Flow Control Performance ance ance ance ance ance ance ance	• Valve stuck open > 12.0%	tion > 10.0% or < -10.0%	• 3.0 s		orrecting Solution in Solutio
P1004 Torque Difference Cylinder 1 Limit Value Ex- ceeded	Differ- ence Cyl- inder 1 Limiting Value Ex- ceeded	• Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Or +50.0 to +30.0 Nm	 Engine running ECM in closed loop ECT > 50° C Baro > 750 hPa Time since engine start > 80.0 s Regeneration = off 	• 120 rev	• 2 DCY ation in this control is the control in the	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check". page 16 and/or to appropriate repair manual.
						- Check Engine Speed Sensor - G28- Refer to ⇒ "3.6.13 Engine Speed Sensor G28, Checking", page 230 . - Check the Fuel Injectors Refer to ⇒ "3.6.18 Fuel Injectors, Checking", page 240 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Tor- que	Torque Differ- ence Cyl- inder 2 Limiting Value Ex- ceeded	Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Or +50.0 to +30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed and desired torque) -50.0 to -30.0 Nm Control error < limit from MAP f (engine speed	 Engine running ECM in closed loop ECT > 50° C Baro > 750.0 hPa Time since engine start > 30.0 s Regeneration = off 	• 120 rev	• 2 DCY	- Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 16 and/or to appropriate repair manual.
		part or in whole, is not be milling to be provided by the prov	_{it} norised by Volkswagen AG.	Volkswage <i>n A</i> d	does not guarant	- Check Engine Speed Sensor - G28 Refer to ⇒ "3.6.13 Engine Speed Sensor G28, Checking", page 230 Check the Fuel Injectors Refer to ⇒ "3.6.38 Fuel Injectors, Checking", page 240.
		opling to the second second purposes, in part or me	Protected by copyright; C	· ĐA n	SENSYIO V VOTABLE	o the correctness of information in this cook.

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P1006 Tor- que Differ- ence Cylin- der 3 Limit Value Ex- cee- ded	Limiting Value Expression by the Control of the Con	+50.0 to +30.0 Nm	 Engine running ECM in closed loop ECT > 50° C Baro > 750.0 hPa Time since engine start > 30.0 s Regeneration = off 	• 120 rev	• 2 DCY Replied	and delivery quantity. Refer to fuel system mechanical festing in "3.1 Preliminary Check". page 16 and/or to appropriate re-



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions 3. Volkswagen AG do	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
3	Differ- ence Cyl- inder 4 Limiting Value Ex- ceeded	Control error < limit from MAP f (engine speed and desired torque) -50.0 to	 Engine running ECT > 50° C Baro > 750.0 hPa Time since engine start > 30.0 s Regeneration = off 	120 rev	• 2 DCY ** 2 DCY ** am liability with respect to the correctness of information in this doctor.	 Check the fuel pressure and delivery quantity. Refer to fuel system mechanical testing in ⇒ "3.1 Preliminary Check", page 16 and/or to appropriate repair manual. Check Engine Speed Sensor - G28 Refer to ⇒ "3.6.13 Engine Speed Sensor G28, Checking", page 230 . Check the Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240 .
P13C E Sen- sor For Inter- nal Pres- sure Of Cylin- der 1 Elec- trical Error	Cylinder 1 Pres- sure Sen- sor Cir- cuit Short To Bat- tery Volt- age	• Signal voltage > 3.17 V	• Engine = run- ning	• 40 rev- olu- tions	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P13C F Sen- sor For Inter- nal Pres- sure Of Cylin- der 1 Short Circuit To Groun d	Cylinder 1 Pres- sure Sen- sor Cir- cuit Short To Ground	Cylinder pres- sure sensor volt- age < 0.13 V	Engine = run- ning	40 rev- olu- tions	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P13D 0 Sen- sor For Inter-	Cylinder 1 Pres- sure Sen- sor Cir- cuit Out Of Range	• Signal voltage < 0.33 V and/or > 3.09 V	Engine = run- ning	• 1,000 revolu- tions	• 2 DCY	 Check the Automatic Glow Time Control Mod- ule - J179 Refer to
nal Pres- sure Of Cylin- der 1 Im- plau- sible	Cylinder 1 Con- stant Pressure	Deviation be- tween maximum and minimum cylinder pressure sensor 1 < 20 bar	 Engine condition = running Throttle valve = open Barometric > 750.0 hPa AG do. 	0.0		⇒ "3.6.2_Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205
Signal	Cylinder 1 Pres- sure Sen- sor Offset	Offset out of range < -7.0 bar and/or > 7.0 bar		is not guaranteed	rac _{Cer}	
	Cylinder 1 Plausi- bility With Calcula- ted Pressure of the community of t	Difference between calculated cylinder pressure, based on intake air pressure and compression ratio, and measured cylinder pressure sensor #1 out of range < -10.0 bar and/or > 10.0 bar	 Throttle valve = open Barometric > 750.0 hPa A. Throttle valve = open Throttle valve = open LP EGR valve = closed HP EGR valve = and/or < 44° C ECT = > 60° C and/or < 100° C 			orrectines
		THO POLITAGO THOUNGOO KA PORTO OR	DA Nags	Wight by Volksw	on information in this go, but the state of	





DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P13D 1 Sen- sor For Inter- nal Pres- sure Of Cylin- der 2 Elec- trical Error	Cylinder 2 Pres- sure Sen- sor Cir- cuit Open Or Short To Bat- tery Volt- age	Signal voltage > 3.17 V	Engine = run- ning	• 40 rev- olu- tions	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205 .
P13D 2 Sensor For Internal Pressure Of Cylinder 2 Short Circuit To Groun d	Cylinder 2 Pres- sure Sen- sor Cir- cuit Short To Ground	Signal voltage < 0.13 V 0.13 V orised by Volkswagen AG. Vol	• Engine = run- ning	• 40 revolutions	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P13D 3 Sen- sor For	Cylinder 2 Pres- sure Sen- sor Cir- cuit Out Of Range	• Signal voltage < 0.33 V and/or > 3.09 V	Engine = run- ning	• 1,000 revolutions	• 2 DCY	Check the Automatic Glow Time Control Mod- ule - J179 Refer to
nai Pres- suire Of Cylin- der 2 Im- plau- sible	Cylinder 2 Con- stant Pressure	Deviation be- tween maximum and minimum cylinder pressure sensor 1 < 20.0 bar	 Engine condition = running Throttle valve = open Barometric > 750.0 hPa 		with respect to the correctness of information in	⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205.
ommer	Cylinder 2 Pres- sure Sen- sor Offset	 Offset out of range < -7.0 bar and/or > 7.0 bar 			nformation in th	
	*Roud Of Burdos	Protected by Copyright	DA Nolkswagen AG.	J. Rivido O. inalinoope	ź.	

-		scan 1001 - Edition U9.				
DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
	Cylinder 2 Plausibility With Calculated Pressure	Difference be- tween calculated cylinder pressure, based on intake air pressure and com- pression ratio, and measured cylinder pressure sensor #1 out of range < -10.0 bar and/or > 10.0 bar	Secondary Parameters with Enable Conditions • Engine conditions • Engine conditions • Engine conditions • Throttle valve = open • LP EGR valve = closed • HP EGR valve = closed • IAT = > -2° C and/or < 44° C • ECT = > 60° C and/or < 100° C	• 40 rev- olu- not tions	ccentary liability with respect to the co	
P13D 4 Sensor For Internal Pressure Of Cylinder 3 Electrical Error	3 Pres- sure Sen- sor Cir- cuit Open Or Short To Bat- tery Volt- age	3.17 V	ning	• 40 revolutions	ctness of information in this odo, the	- Check the Automatic Glow Time Control Mod- ule - J179- Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205
P13D 5 Sensor For Internal Pressure Of Cylinder 3 Short Circuit To Groun d	3 Pressure Sensor Circuit Short To	• Signal voltage ≤ 0.13 V	• Engine = run	40 revolu- tions	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P13D 6 Sen- sor For Inter-	Cylinder 3 Pres- sure Sen- sor Cir- cuit Out Of Range	 Signal voltage < 0.33 V and/or > 3.09 V 	Engine = run- ning	• 1,000 revolu- tions	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to
nal Pres- sure Of Cylin- der 3 Im- plau-	Cylinder 3 Con- stant Pressure	Deviation be- tween maximum and minimum cylinder pressure sensor 1 < 20.0 bar	 Engine condition = running Throttle valve = open Barometric > 750.0 hPa 			⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205 .



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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	nation	Component Diagnostic Procedure
sible Signal	Cylinder 3 Pres- sure Sen- sor Offset	Offset out of range < -7.0 bar and/or > 7.0 bar			Tigh lity W.	
	Cylinder 3 Plausi- bility With Calcula- ted Pressure	Difference be- tween calculated cylinder pres- sure, based on intake air pres- sure and com- pression ratio, and measured cylinder pressure sensor #1 out of range < -10.0 bar and/or > 10.0 bar	 Engine condition = fuel cut off Throttle valve = open LP EGR valve = closed HP EGR valve = closed IAT = > -2° C and/or < 44° C ECT = > 60° C and/or < 100° C 	• 40 revolutions	I DCY	spect to the correctness of <i>informatic</i>
P13D 7 Sensor For Internal Pressure Of Cylinder 4 Electrical Error	Cylinder 4 Pres- sure Sen- sor Cir- cuit Open Or Short To Bat- tery Volt- age	• Signal voltage > 3.17 V	• Eugine = run-	• 40 revolutions	DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P13D 8 Sen- sor For Inter- nal Pres- sure Of Cylin- der 4 Short Circuit To Groun d	Cylinder 4 Pres- sure Sen- sor Cir- cuit Short To Ground	Signal voltage < 0.13 V	Engine = run- ning	• 40 rev- olu- tions	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
P13D 9 Sen- sor For Inter- nal Pres- sure	Cylinder 4 Pres- sure Sen- sor Cir- cuit Out Of Range	Signal voltage < 0.33 V and/or > 3.09 V	Engine = run- ning	• 1,000 revolu- tions	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control

	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
	Of Cylin- der 4 Im- plau- sible Signal	Cylinder 4 Con- stant Pressure	Deviation be- tween maximum and minimum cylinder pressure sensor 1 < 20.0 bar	 Engine condition = running Throttle valve = open Barometric > 750.0 hPa 			Module J179 and Glow Plug, Check- ing", page 205
		Cylinder 4 Pres- sure Sen- sor Offset	10/821				
poses, in part or in wholes;	P13E 0	Cylinder of 4 Plausi- 4 Plausi- bility With Calcula- ted Pres- sure	Difference be- tween calculated cylinder pres- sure, based on intake air pres- sure and com- pression ratio, and measured cylinder pressure sensor #1 out of range < -10.0 bar and/or > 10.0 bar	 Engine condition = fuel cut off Throttle valve = open LP EGR valve = closed HP EGR valve = closed IAT = > -2° C and/or < 44° C ECT = > 60° C and/or < 100° C 	acceptam liability with respect to the	the correctness	
, merci	Sen- sor For Inter-	Cylinder 1 Pres- sure Sen- sor Cir- cuit Plau- sibility Check	• Pressure based measured TDC position sensor #1 out of range < -1.8 CA and/or > 1.8 CA	 Engine condition = fuel cut off ECT > 69.96° C Engine condition = fuel cut 	• 40 rev-olu- olu- tions	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205 .
	P13E 1 Sen- sor For Inter- nal Pres- sure Of Cylin- der 2 Mal- func- tion	Cylinder 2 Pres- sure Sen- sor Cir- cuit Plau- sibility Check	Pressure based measured TDC position sensor #1 out of range < -1.8 CA and/or > 1.8 CA Pressure based measured TDC position sensor #1 out of range < -1.8 CA	 Engine condition = fuel cut off ECT > 69.96° C 	• 40 rev- olu- tions	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205.



	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
	P13E 2 Sen- sor For Inter- nal Pres- sure Of Cylin- der 3 Mal- func- tion	3 Pres- sure Sen- sor Cir- cuit Plau- sibility Check	Pressure based measured TDC position sensor #1 out of range < -1.8 CA and/or > 1.8 CA	 Engine condition = fuel cut off ECT > 69.96° C 	• 40 revolutions	• 2 DCY	- Check the Automatic Glow Time Control Mod- ule - J179 Refer to ⇒ "3.6.2 Au- tomatic Glow Time Control Module J179 and Glow Plug, Check- ing", page 205
	P13E 3 Sen- sor For Inter- nal Pres- sure Of Cylin- der 4 Mal- func- tion	Cylinder 4 Pres- sure Sen- sor Cir- cuit Plau- sibility Check	Pressure based measured TDC position sensor #1 out of range < -1.8 CA and/or > 1.8 CA	 Engine condition = fuel cut off ECT > 69.96° C 	• 40 rev- olu- tions	• 2 DCY	- Check the Automatic Glow Time Control Module - J179 Refer to ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205 .
	1 Sig- nal Too	Low Pressure EGR Sensor Position Circuit High	Position sensorger Signal < 4,850.0 mV	P0651 AG does not guarantee or acc	• 480.0 ms	• 2 DCY	- Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .
purposes, in part or in whole, is,	P140 E EGR Sen- sor 2 Bank 1 Sig- nal Too High	Low Pressure EGR Sensor Position Circuit Low	Position sensor signal < 150.0 mV		ms ms		- Check the EGR Valve 2 - GX6 Re- fer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .
commercial purposes, in part or in whole, is my	DO BANK TO SEE	Montdoo Montdoo	Protected by	DA NOBEWRANO V VOTINETINGO DE	finformation in this od		
						3. Diaç	gnosis and Testing

P169 A Loading Mode Active **Transport Mode Active** **Mode Active** **Transport mode active** **Production mode not active and vehicle mileage below 100 miles with a scan tool or will automatically switch off after approximately 100 km (62.15 miles) have accumulated on the vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since initial vehicle start-up < 200 miles **Max. driving distance since in the vehicle start-up < 200 miles **Max. driving distance since in the vehicle start-up < 200 miles **Max. driving distance since in the ve	DTC / Monitor De- Strategy scrip- tion tion		Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
page 17.	A Mode Ad Load- ing Mode	- active	mode not active and vehicle mileage below 100 miles • And • Vehicle speed < 5 mph • Engine speed =	stored in fault in fault ry dur- ing ECU shut down	olkswagen AG d	Transport Mode (Loading Mode). It can be turned off with a scan tool or will



					Q	C ₂
DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2000 NOx Ab-	NOx Ab- sorber Efficiency Below Thresh- old	Oxygen signals post NOx trap < 0.95 Oxygen signals pre NOx trap < 0.045 Mass of reductant consumption < 0.9 g	 Regeneration demand for NOx trap = on Adaptation of oxygen sensor pre and post NOx trap = realized Engine speed 1,000 - 2,750 RPM Upstream turbine temperature 50 - 850° C Temperature of upstream NOx trap 220 - 550° C ECT 40 - 105° C Fuel temp < 90° C APP > 1.0% and < 100.0% Engine run time > 240.0 s Baro > 750.0 hPa 	• 10.0 s	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10- Refer to ⇒ "3.6.29 Oxygen Sensor 1 Before Catalytic Converter GX10 Checking", page 264 Check the Oxygen Sensor 1 After Catalytic Converter - GX7- Refer to ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7. Checking", page 261 - Check the Exhaust Gas Temperature Sensors Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors Checking", page 234

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure		
Partic- ulate	Below Thresh- old	ume flow)OrAccumulated loading incre-	Time since engine start 90.0 s exhaust temperature downstream EGR - cooler > 60° C or < 200° C	• 6.0 s	• 2 DCY	Regeneration Service must be performed. Refer to appropriate repair manual. Check the		
Bank 1		ment from differ- ential pressure < 1.0 g	HP - EGR valve < 30.0% openLP - EGR mass			Exhaust Pressure Sensor 1 -		
			flow > 17 kg/h • LP - EGR valve > 55.0% open for > 2.5 s	, by Volkswag	_{en} AG. Volkswag	G450 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1		
			Temperature downstream DPF < 400° C or > 140° C	yis edby	Pressure Sensor 1 G450, Checking", page 236	POF acce		
			 DPF regeneration and active Above conditions must be fulfilled accumu- 			Pressure Sensor 1 G450, Checking", page 236. - Check the Differential Pressure Sensor - G505 Refer to ⇒ "3.6.7 Differential Pressure Sensor G505, Checking", page 218. - The diesel particulate filter may need to be replaced. Refer to ap- propriate re- pair manual.		
		Differential pressure signal < f (exhaust gas volume flow)	lative for 40.0 s to get a monitor result			⇒ "3.6.7 Dif- ferential Pressure Sensor		
			sure signal < f (exhaust gas vol-	sure signal < f (exhaust gas vol-	sure signal < f (exhaust gas vol-	sure signal < f (exhaust gas volume flow) ume flow) under the flow in the flow		Checking", page 218. - The diesel particulate
			• Exhaust gas volume flow > 160.0 and < 600.0 mA 3/h			filter may need to be replaced. Refer to ap- propriate re-		
			ECT > f (ambi- ent tempera- ture) Time since on	Pundoo Na peloelo	rW	pair manual.	COP.	
			Time since en- gine start > 300.0 s	-+09}(24	.ĐA nghọ.		



DTC De- scrip- tion	Strategy	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
101/08/171;	es unless authorises	Ratio of filtered temperature dynamic upstream and downstream of the PM trap < 1.2 [-] Intake manifold Intake manifold	Exhaust gas temp. before and after PM trap > 29.96° C Time since PM trap regeneration > 2.0 s ECT > -15° C Time since engine start > 10.0 s gen AG does not guarantee.	Acceleration or deceleration time at most 200.0 s (data gathering frozen if continuous acceleration or deceleration lasts more than 35.0 s)		
P200 Intake Mani fold Run- con- trol Stuck Oper Bank	Manifold Runner Flap Stuck Open	Intake manifold runner stuck (open) > 12.0%	Control deviation detected > 10.0% or < -10.0%	• 14.0 s	2 DCY act to the correctness of infa-	- Check the Intake Flap Control Unit - GX14 Refer to ⇒ "3.6.24 Intake Flap Control Unit GX14 , Checking", page 252 .
Intak	Stuck Closed	• Intake manifold runner stuck (closed) < 12.0%	Control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation detected > 10.0% or < -10.0% Annual of the control deviation deviation detected > 10.0% or < -10.0% Annual of the control deviation d	• 14.0 % hh	• 2 DCY	- Check the Intake Flap Control Unit - GX14 Refer to ⇒ "3.6.24 Intake Flap Control Unit GX14 , Checking", page 252 .
	Motor Circuit Open	• Signal voltage > 0.8 or < 2.0 V	ECM power stage = off	• 0.6 s • Continuous	• 2 DCY	- Check the Intake Flap Control Unit - GX14 Refer to ⇒ "3.6.24 Intake Flap Control Unit GX14 , Checking", page 252 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2009 Intake Manifold Runner Control Circuit Low Bank	Manifold	Signal current > 8.0 - 18.0 A Signal current > 8.0 - 18.0 A Signal current > 8.0 - 18.0 A	ECM power stage = on agen AG does not guarantee	• 0.5 s	• 2 DCY	- Check the Intake Flap Control Unit - GX14 Refer to ⇒ "3.6.24 Intake Flap Control Unit GX14. Checking", page 252.
Intake Mani-	Intake Manifold Runner Motor Circuit Short To Battery Voltage	• Signal current > 8.0 – 18.0 A	• ECM power stage = on	• 0.5 s	2 DCY accept to the correctness of in	- Check the Intake Flap Control Unit - GX14 Refer to ⇒ "3.6.24 Intake Flap Control Unit GX14, Checking", page 252.
Manifold Runner Position Sensor/ Switc	Intake Manifold Runner Position Sensor Circuit Physical Signal Range Check High	• Signal voltage > 4.61 V	- DA nagewaylo V Vd ng ng	• 0.5 s	2 DCY	- Check the Intake Flap Control Unit - GX14 Refer to ⇒ "3.6.24 Intake Flap Control Unit GX14 , Checking", page 252 .
h Circuit Rang e/ Performanc e Bank 1	Intake Manifold Runner Position Sensor Circuit Physical Signal Range Check Low	• Signal voltage < 0.39 V	-ĐA nagswo.,			
P2016 Intake Manifold Runner Position Sensor/ Switc h Circuit Low Bank 1	Intake Manifold Runner Position Sensor Circuit Short To Ground	• Signal voltage < 0.25 V		• 0.5 s	• 2 DCY	- Check the Intake Flap Control Unit - GX14 Refer to ⇒ "3.6.24 Intake Flap Control Unit GX14 . Checking", page 252 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2017 Intake Manifold Runner Position Sensor/ Switc h Circuit High Bank	Manifold Runner Position Sensor Circuit Short To Battery Voltage	Signal voltage > 4.75 V Signal voltage > 5.60 pt. 10	_{.sw} agen AG. Volkswagen A	• 0.5 s	• 2 DCY	- Check the Intake Flap Control Unit - GX14 Refer to ⇒ "3.6.24 Intake Flap Control Unit GX14 . Checking", page 252 .
P2031 Ex- haust Gas Tem- pera- ture Sen- sor Circuit Bank 1 Sen- sor 2	Gas = Temperature Sensor 3 Cifcuit Open Or Short To Bat-	Signal voltage > 1.72 V Signal voltage >	Engine running	ms	a sunda	Exhaust Gas Temperature Sensors . Refer to 3.6.15 Exhaust Gas Temperature Sensors . Chocking"
P2032 Ex- haust Gas Tem- pera- ture Sen- sor Circuit Low Bank 1 Sen- sor 2	Gas	Signal voltage < 0.45 V Output Outp	• Engine running	O.084 em	• KOZ DUY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking", page 234 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Ex- haust	ture Sen- sor 1 Cir- cuit Plau- sibility Check	Sensor temperature < 85° C	 Engine run time > 3.0 min ECT > 10° C Simulated sensor temp > 300° C 		• 2 DCY	- Check the Exhaust Gas Temperature Sensors Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors Checking", page 234
Ex- haust Gas Tem- pera- ture Sen- sor Circuit Rang e/ Per- for- manc e Bank	Check Check or in Whole, is not in the control of t	• Sensor temperature < 85° C	 Engine run time > 3.0 min ECT > 10° C Simulated sensor temp > 250° C 		• 2 DCY	to the correctness of
	Pammo to are.	All to the	Jord - Proge	PANIBURD NOIKEM	""Omation in this occupation is to be a second or the second of the seco	



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure	
Treat- ment Fuel Sup- ply Con- trol Per- for- manc e	After Treat- ment Fuel Sup- ply Con- trol Per- formance		demand for NOx trap = On Adaptation of oxygen sensor pre and post NOx trap = realized Engine speed 1,100 – 2,800 RPM Upstream turbine temperature > 50 – 850° C Temperature of upstream NOx trap > 220 – < 410° C ECT 40 – 105° C Vehicle speed > 34 kph Fuel temp < 70° C Atmospheric press > 750.0 hPa APP > 1.0% and < 100.0% Engine run time > 240.0°s		• 2 DCY Volkswagen AG	Converter . Refer to ⇒ "3.6.31" Three Way Catalytic Converter (TWC), Checking", page 269 - The diesel particulate filter may need to be replaced. Refer to ap- propriate re- pair manual.	Oranz life
		• Signal Voltage < 4.7 V	• ECM power stage = off	(9 ₀₀₎ 480.0 ms ¹ d	• 2 DCY	Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270.	



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation G. Volkswagen A	Component Diagnostic Procedure
Throt- tle Ac- tuator "A" Con- trol	tuator Control Motor Circuit In- ternal Electrical	Signal current > 3.0 A	• ECM power stage = active	480.0 ms	• 2 DCY	- Check-the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3 . Checking", page 270 .
P2102 Throt- tle Ac- tuator "A" Con- trol Motor Circuit Low	Valve Ac-	• Signal voltage < 2.97 V	ECM power stage = off ECM power stage = active	• 480.0 ms	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3 . Checking", page 270
Throt- tle Ac- tuator "A" Con- trol Motor Circuit High	Control Motor Circuit Short To Battery Voltage		ECM power stage = active	* 480.0	9	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3. Checking". page 270 .
	Throttle Actuator Control System Stuck Open	 Valve stuck open > 12.0% 	• Control devia- tion > 10.0% and/or < -10.0%	• 3.0 s	• 2 DCY	- Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2112 Throt- tle Ac- tuator "A" Con- trol Sys- tem - Stuck Close d		Valve stuck closed < 12.0%	dunies authorised Dy	• 3.0 s	• 2 DCY Volkswagen AG	- Check the Throttle Valve Control Module - GX3 Refer to
P2122 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "D" Circuit Low	Throttle/ Pedal Position Sensor/ Switch "D" Cir- cuit Low	• Signal voltage < 0.61 V	Will Work of South	• 200.0 ms	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 203.
P2123 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "D" Circuit High		Signal voltage >	Semmos to ake individuo sinto indoinadoo)	• 200.0 ms	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2- Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2 Checking", page 203
P2127 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "E" Circuit Low	Throttle/ Pedal Position Sensor/ Switch "E" Cir- cuit Low	Signal voltage > 0.27 V		• 200.0 ms	• 2 DCX ^{US}	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 203.
P2128 Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "E" Circuit High	Throttle/ Pedal Position Sensor/ Switch "E" Cir- cuit High	Signal voltage > 2.43 V		• 200.0 ms	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 203.

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Throt- tle/ Pedal Posi- tion Sen- sor/ Switc h "D"/"E " Volt- age Corre- lation	Throttle/ Pedal Position Sensor/ Switch "D"/"E" Voltage Correla- tion	Difference be- tween app sen- sor 1 voltage and app sensor 2 voltage) V (toler- ance 13.0% – 20.0%)	G. Volkswagen AG does no	• 260.0 ms	• 2 DCY	- Check the Accelerator Pedal Mod- ule - GX2 Refer to ⇒ "3.6.1 Ac- celerator Pedal Mod- ule GX2, Checking", page 203 .
Fuel Injec- tor Group "A" Sup- ply	Fuel In- jector Group "A" Sup- ply Volt- age Cir- cuit Shor- ted Inter- nally	Diagnostic signal in power stage = failed	Injector valve = switched on	 4 [in-jec-tions] Continuous 	2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240 .
P2149 Fuel Injector Group "B" Supply Voltage Circuit/ Open	Fuel Injector Group "B" Supply Voltage Circuit Shorted Internally	Diagnostic signal in power stage = failed Ado THOLAGO AG PORTONION Temperature dif-	• Injector valve = switched 0n	4 [in-jec-tions] Contin-uous	• 2 DCY	- Check the Fuel Injectors . Refer to ⇒ "3.6.18 Fuel Injectors , Checking", page 240 .
P2183 Engine Coolant Temperature Sensor 2 Circuit Rang e/ Performanc e	Engine Coolant Tempera- ture Sen- sor On Radiator Circuit Range / Perform- ance	Temperature difference to at least 3 other temperature sensors at startup > 30 K	 Engine off time > 9.0 hr IAT change after engine start < 5 K ECT sensor 1 or 2 < 30° C Decrease of coolant temperature 1 or 2 after engine start < 5 K 	60.0 s, including 20.0 s continuous driving with velocity exceeding 25 mph Continuous	• 2 DCY	- Check the Engine Cool- ant Temper- ature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.12 Engine Cool- ant Temper- ature Sensor On Radiator Outlet G83, Checking", page 228 .



	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
	Engine Coolant Temperature Sensor 2 Circuit Low	Engine Coolant Tempera- ture Sen- sor On Radiator Outlet Circuit Short To Ground	• Signal voltage < 0.15 V	does not guarantee or acceptal	480.0 ms Continuous	• 2 DCY	- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.12 Engine Coolant Temperature Sensor On Radiator Outlet G83 , Checking", page 228 .
orin whole, is not be solved to	P2185 Engine Coolant Temperature Sensor 2 Circuit High	Engine Coolant Tempera- ture Sen- sor On Radiator Outlet Circuit Open Or Short To Battery Voltage	• Signal Voltage > 3.25 V		480.0 ms	• 2 DCY	- Check the Engine Coolant Temperature Sensor On Radiator Outlet - G83 Refer to ⇒ "3.6.12 Engine Coolant Temperature Sensor On Radiator Outlet G83 . Checking", page 228 .
TOO TO SHAWAY	THO POSITIONS	Diybindoo Kape	Protection Protection	DEWEMIO VERTICATION JOSEPH 2000	on in this of		

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
O2 Sensor Signal Biase d/ Stuck Lean Bank	Sensor ^d	• Deviation to oxygen concentration (while fuel cutoff) > 4.6% vol / yoln AG. Volkswall Volkswall AG. Volkswall A	Engine in fuel cutoff EGR high and age low pressure, closed not get a closed not g	• 2.0 s • Continuous Oracogoram liability milmon	• 2 DCY	- Check the Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to ⇒ "3.6.29 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 264. - Check the Fuel Delivery Unit - GX1-/Fuel Pump Relay - J17 Refer to ⇒ "3.6.17 Fuel Delivery Unit GX1/Fuel Pump Relay J17, Checking", page 238. - Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9. Checking", page 255.



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2196 O2 Sen- sor Signal Biase d/ Stuck Rich Bank 1 Sen-	sor Sig- nal Biased/ Stuck Rich Bank 1 Sensor 1	Deviation to oxygen concentration (while fuel cutoff) < -6.3% vol / vol	 Engine in fuel cutoff EGR high and low pressure, closed O2 heater temperature > 720 and/or < 840° C Integrated air flow while in 	• 2.0 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Cata- lytic Con- verter - GX10 Re- fer to ⇒ "3.6.29 Oxygen Sensor 1 Before Cata-
sor 1		ojsed by Volkswagen AG	fuel cut-off > 85.0 g •VolRegeneration inactive • Engine speed >	auarantee oracel		lytic Con- verter GX10 Checking", page 264 - Check the
ses. in Dart or:	or manale, is not benning	sauthorised by Volkswagen AG	1,200 RPM • Air mass 250.0 – 3,000.0 mg/ stroke	of accept	and liability with respect to the correctness of information	Fuel Delivery Unit - GX1- / Fuel Pump Relay - J17 Refer to ⇒ "3.6.17 Fuel Delivery Unit GX1 / Fuel Pump Relay J17 , Checking", page 238 .
	O2 Sen-			(100°, 100°)	in this go	- Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9, Checking", page 255 .
P2237 O2 Sensor Positive Current Control Circuit/ Open Bank 1 Sensor 1	O2 Sen- sor Posi- tive Cur- rent Con- trol Cir- cuit/Open Bank 1 Sensor 1	Pump current (IP) € 0,005 [-]	 Calculated oxygen concentration > 0,070[2] Fuel cutoff = not active Battery voltage > 10.7 V 	• Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Cata- lytic Con- verter - GX10 Re- fer to ⇒ "3.6.29 Oxygen Sensor 1 Before Cata- lytic Con- verter GX10, Checking", page 264 .

D0040 00 0		Conditions	Time Length	nation	agnostic Proce- dure
P2243 O2 Sen- o2 Sen- sor Ref- erence Voltage Circuit/ Open Bank 1 Sen- sor 1	 Nernst voltage (UN) internal resistance > 1,104.0 Ω Internal signal voltage > 3.0 V voltage > 3.0 V voltage Wirtual ground 	HO2 sensor heater temperature > 720° C Battery voltage = exhaust gas flow, exhaust gas temperature at sensor element HO2 sensor	• 4.0 s • Continuous	• 2 DCY	- Check the Oxygen Sensor 1 Before Cata- lytic Con- verter - GX10 Re- fer to ⇒ "3.6.29 Oxygen Sensor 1 Before Cata- lytic Con- verter GX10, Checking", page 264.
O2 sor Neg- sen- ative Cur- rent Con- trol Cir- tive cuit/Open Cur- Bank 1	Virtual ground (VM) internal resistance > 1,104.0 Ω Internal signal voltage < 1.4 V and/or > 1.6 V	heater tempera- ture > 720° C Battery voltage = exhaust gas flow, exhaust	• Continuous	to month in this ocultary	Oxygen Sensor 1 Before Cata- lytic Con- verter - GX10- Re-



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
tion P2270 O2 Sensor Signal Biase d/ Stuck Lean Bank 1 Sensor 2	O2 Sen- sor Sig- nal Biased/ Stuck	Deviation to oxygen concentration during fuel cutoff > 4.6% vol / vol	 Fuel cutoff = active Low and high pressure EGR closed Heater control = active Modeled dew point = exceeded O2 Heater temp > 720 and/or < 840° C Regeneration = inactive 	• 2.0 s	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 261.
	in whole, is not be mile.	Junias authorised by Volkswage	gen concentration = stationary (for 1.5 s within 2.0% O2 range) AGCurrent air AG does mass > 100.0 mg/stroke Integrated air flow while in fuel cutoff > 70.0 g Engine speed > 1,200 RPM Battery voltage	not guarantee or	ccedtany liability with respect t	
	of Wake of commercial purposes, in part or	Adulydo Adelogo yd beloefol	A DA Nagsw	SHIO V VOT MEDING OF	ect to the correctness of information in this obounds.	

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2271 O2 Sensor Signal Biase d/ Stuck Rich Bank 1 Sensor 2	sor Sig- nal Biased/ Stuck Rich Bank 1 Sensor 2	Deviation to oxygen concentration during fuel cutoff < -6.3% Additional cutoff < -6.3% Additional cutoff < -6.3% Additional cutoff < -6.3% Additional cutoff < -6.3%	 Fuel cutoff = active Low and high pressure EGR closed Heater control = active Modeled dew point = exceeded O2 heater temp > 720 and/or < 840° C Regeneration = inactive Calculated oxygen concentration = stationary (for 1.5 s within 2.0% O2 range) Current air mass > 100.0 mg/stroke wagen integrated air flow while in fuel cutoff > 70.0g Engine speed > 1,200 RPM Battery voltage > 10.7 V 	NG does not guaj	• 2 DCY	- Check the Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 261.
	mercial purposes, in part or in who	E STAND O THE WAY OF T	Protected Secretary Secret	(DA VOIKSWAGEN)	John Maria Transfer of the Control o	with respect to the correctness of $information$ in K .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
		tween actual air- flow and mod- eled mass air flow < 0.7	 Exhaust throttle valve > 89.5 and < 100.5% Throttle valve < 100.5% > 99% Intake flap < 101.0% > -1.0% Engine speed 1,200 – 3,500 RPM ECT between 69.95 and 106.95° C Fuel quantity > 30.0 mg/hub 	• 3.0 s	• 2 DCY	- Check for air leaks between the MAF and the throttle body, oil fill cap not tight or oil dipstick not seated in tube. Also check for any engine gaskets that can cause additional air to enter the crankcase can set this fault as the PCV system is not metered. If a vacum leak or crankcase seal is the cause, the idle may be rough or unstable.
mmercial purposes, in part or in whole, is p.		norised by Volkswagen AG. Vo			with respect to the correctness of information	 Check the Intake Manifold Sensor - GX9 Refer to ⇒ "3.6.25 Intake Manifold Sensor GX9, Checking", page 255. Check the Throttle Valve Control Module - GX3 Refer to ⇒ "3.6.32 Throttle Valve Control Module GX3, Checking", page 270.
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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Pres- sure	Pressure Regulator "B" Con- trol Cir- cuit Open		Time after engine start 5.0 – 15.0 s	• 50.0 – 290.0 ms • Contin- uous	• 2 DCY	- Check the Fuel Pres- sure Regula- tor Valve - N276 Re- fer to ⇒ "3.6.20 Fuel Pres- sure Regula- tor Valve N276 . Checking", page 244 .
		Samiladunias sauthoris ed by Voll	_{SW} agen AG. Volkswagen A	G does not guar	anice or accept and liable.	- Check the Fuel Meter- ing Valve - N290 Re- fer to ⇒ "3.6.19 Fuel Meter- ing Valve N290 , Checking", page 242 .
P2295 Fuel Pressure Regulator "A" Control Circuit Low	Fuel Pressure Regulator "B" Control Cir. Sesodand reio. Particular Low Sesodand reio. Particular Sesonal S	• Signal voltage < 2.0 V	• Time after engine start 5.0 – 15.0 s	• 50.0 – 290.0 ms • Contin- uous	• 2 DCY	Check the Fuel Pressure Regulator Valve - N276 Refer to 3.6.20 Fuel Pressure Regulator Valve N276. Checking", page 244.
		SO O SEALUR TO BUILDO ; WEILADO NAD	Protecte BLA 2	ny Volkswagen	Joundon insurander	Check the Fuel Meter- ing Valve - N290 Re- fer to ⇒ "3.6.19 Fuel Meter- ing Valve N290 , Checking", page 242 .



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Pres- sure	Fuel Pressure Regulator "B" Con- trol Cir- cuit High	Signal current > 3.0 A	Time after engine start 5.0 – 15.0 s	• 0.2 s • Continuous	• 2 DCY	- Check the Fuel Pres- sure Regula- tor Valve - N276 Re- fer to ⇒ "3.6.20 Fuel Pres- sure Regula- tor Valve N276, Checking", page 244.
	(U) 00 HU 00 100	ass authorised by Volkswagen A	G. Volkswagen AG does no	t guarantee or acco	Brand libility w	- Check the Fuel Meter- ing Valve - N290 Re- fer to ⇒ "3.6.19 Fuel Meter- ing Valve N290, Checking", page 242.
P240 F EGR Slow Re- spons e	System Dynamic Check	• Calculated characteristics value: Positive gradient of target air mass flow > 20.0 [-]	30.0% and/or < 89.0% • Fuel quantity > 5.0 mg	• 10.0 s	Cespect to the correctness of information in this cool, the correctness of the	- Check the EGR Valve 1 - GX5 Refer to ⇒ "3.6.9 EGR Valve 1 GX5, Checking", page 222 . - Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
		Calculated characteristics value: Negative gradient of target air mass flow > 20.0 [-]	 EGR valve > 30.0% and/or < 89.0% Fuel quantity > 5.0 mg Engine speed 1,300 – 2,500 RPM ECT > 20° C Ambient temp > -10° C Exhaust flap motor > 20.0% and/or < 89.0% LP EGR valve > 20.0% and/or < 89.0% Desired air mass charge < -40.0 mg/stroke and/or > -600.0 mg/stroke 	n AG. Volkswag	∍n AG does not gu	tarantee or acceptanniability mit
P2413 EGR Sys- tem Per- for- manc e	EGR System / Fuel Mean Value Adaption	 Number of learning points at fuel mass adaptation limit >= 4 At upper limit = 6.0 mg/stroke At lower limit = 	Sundo Ad baloator	• 480.0 ms • Once / DCY	• 2 DCY	- Check the EGR Valve 1 - GX5 Refer to ⇒ "3.6.9 EGR Valve 1 GX5, Checking", page 222 . - Check the EGR Valve 2 - GX6 Refer to ⇒ "3.6.10 EGR Valve 2 GX6, Checking", page 224 .
P242 A Ex- haust Gas Tem- pera- ture Sen- sor Circuit Bank 1 Sen- sor 3	Exhaust Gas Tempera- ture Sen- sor 3 Cir- cuit Open Or Short To Bat- tery Volt- age	Signal voltage > 1.72 V	J. Lifected by Copyright	• 480.0 ms	DA Negeneallo Vy	Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors , Checking", page 234 .



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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
Bank Sen-		Comparison of upstream turbine exhaust gas temp vs modeled temperature < 45 K	 Engine run time > 3.0 min ECT > 10° C Simulated sensor temp > 300° C Or Engine off time > 32,400.0 s Decrease of IAT after engine start < 5 K Decrease of AAT after engine start < 5 K 	• 20.0 s with speed above 25 mph	• 2 DCY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking", page 234 .
P242 C Ex- haust Gas Tem- pera- ture Sen- sor Circuit Low Bank 1 Sen- sor 3	To Ground	• Signal voltage < 0.45 V	DA nagenagen AG.	פווו ט.טעדין	• 2 DCY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking", page 234 .
P244 C Ex- haust Tem- pera- ture Too Low For Partic- ulate Filter Re- gener- ation Bank 1	Gas Tempera- ture Sen- sors Cir- cuit Feed- back Check	Time to activate control loop EGT Upstream turbine > 45.0 s	 Regeneration demand for PM trap = On Temperature upstream turbine > 300° C Desired post injection > 1.0 mg/stroke Fuel quality > 10.0 and/or < 30.0 mg/stroke Engine speed > 1,200 and/or < 2,850 RPM ECT between 20.1 – 114.9° C Vehicle speed > 5 MPH 	• 45.0 s	• 1 DCY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking", page 234 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
		Time to activate control loop EGT Upstream particulate matter trap > 60.0 s Time to activate control loop EGT Upstream particulate matter trap > 60.0 s	 Regeneration demand for PM trap = On Temperature upstream turbine > 300° C Desired post injection > 5.0 mg/stroke Fuel quality > 10.0 and/or < 44.9 mg/stroke Engine speed > 1,200 and/or < 3,050 RPM ECT between 20.1 - 114.9° C Vehicle speed > 35 MPH 	• 60.0 s		
	Circuit Short To Battery Voltage	• Signal voltage	20.1 – 114.9° C • Vehicle speed > 35 MPH agen AG does not guarantee	480.0 ms Acaccaptan liability with reserving the second sec	• 2 DCY	- Check the Exhaust Pressure Sensor 1 - G450 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450, Checking", page 236.
P2453 Particulate Ulate Filter Pressure Sensor "A" Circuit Rang For		 Differential pressure signal > 200.0 hPa and/or < -150.0 hPa Or Differential pressure signal > 80.0 hPa and/or < -80.0 hPa Offset corrected differential pressure signal > 10.0 hPa and < -10.0 hPa 	 Engine condition = after-run Time since engine stop > 5.0 s ECT > 59.96° C Offset adaption during driving cycle = successful 	• 500.0 ms	2 DCY 2 by the correctness of info-	- Check the Exhaust Pressure Sensor 1 - G450 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450 . Checking", page 236 .
	40/1/V	Protected by cop	- ĐA negeweylo V Vahabiya			



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
	Exhauste Pressure Sensor Circuit To Short I d Ground			• 480.0 ms	• 2 DCY	Check the Exhaust Pressure Sensor 1 - G450 Refer to the Exhaust Pressure Sensor 1 - G450 - Checking page 236 .
	Exhaust Pressure Sensor Circuit Plausibili- ty Check	 Inverse change of differential pressure per time > 10.0 hPa/s Inverse change of differential pressure per time > -10.0 hPa/s 	 Change of volume flow < -20 (m^3/h)/s Change of volume flow > 20 (m^3/h)/s Engine = runging Time since engine started = 20.0 s 	• 9.5 s		- Check the Exhaust Pressure Sensor 1 - G450 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450 . Checking", page 236 .
P2457 EGR Cool- er "A" Effi-	Exhaust Gas Re- circula- tion Cool- ing Sys- tem Per- formance	Sensor temperature above threshold ≥ 40 K	 ECT > 70° C Exhaust gas temperature upstream LP EGR cooler > 300° C Engine speed > 900 RPM Mass flow low pressure EGR > 0.1kg/h < 200.0 kg/h Engine run time > 2.0 min Status exhaust gas treatment = inactive PM trap regeneration 	• 45.0 s	• 2 DCY	- Check the EGR Valve 1 - GX5 Refer to ⇒ "3.6.9 EGR Valve 1 GX5. Checking". page 222 . - Check the EGR Temperature Sensor - G98 Refer to ⇒ "3.6.8 EGR Temperature Sensor G98, Checking". page 220 . - Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking". page 234 .

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2458 Particulate Filter Regeneration	Diesel Particu- late Filter Regener- ation Du- ration	Regeneration time > 90.0 min authorised by Volkswage authorised by Volkswage	PM trap regeneration = active PM trap regeneration has a consended successfully = true	• 90.0 min	• 1 DCY	Regeneration Service must be performed. Refer to appropriate repair manual.
tion Bank 1	oses, in part or in whole, is not bearing.	• Regeneration time > 90.0 min			1 DCY ACCORDIGATION MINITED PROVIDENCE OF THE CONTROLLING ACCORDIGATE MINITED	page 236.
	purpo oommercial purpo	Started by copyrights Copyrights		SMOVED INDIVIDUA	Tress of information in this coching in	- Check the Differential Pressure Sensor - G505 Refer to ⇒ "3.6.7 Differential Pressure Sensor G505, Checking", page 218 .
		o ^j eci _{ed A} .	rg .DA 1190sv	<i>⊕n</i>		 The diesel particulate filter may need to be replaced. Refer to appropriate repair manual.



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
ulate Filter	Particu- late Filter Regener-	PM trap loading of dynamically rising threshold for (simulated engine emissions)	eration = not active	70 miles	ed and liability with respect to the correctness of information in this obcurred	 Regeneration Service must be performed. Refer to appropriate repair manual. Check the Exhaust Pressure Sensor 1 - G450 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450, Checking", page 236. Check the Differential Pressure Sensor - G505 Refer to ⇒ "3.6.7 Differential Pressure Sensor G505, Checking", page 218. The diesel particulate filter may need to be replaced. Refer to appropriate repair manual.

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure	
Partic-	Diesel Particu- late Filter Soot Ac- cumula- tion	Calculated particulate matter trap loading > 40.0 g		• 200.0 ms	• 2 DCY	 Regeneration Service must be performed. Refer to appropriate repair manual. 	
Accumulation Bank						- Check the Exhaust Pressure Sensor 1 - G450 Refer to ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450, Checking", page 236.	
			ole is a state of the state of	_{ed} by Volkswage	n AG. Volkswage	- Check the Differential Pressure Sensor - G505 Refer to nA (⇒ "3.6.7 Differential Pressure Sensor G505. Checking", page 218.	or accept any liability with re
			part or in whole, is not be			 The diesel particulate filter may need to be replaced. Refer to ap- propriate re- pair manual. 	Billywithres
E Ex- haust Gas Tem- pera- ture Sen- sor Circuit Bank	Exhaust Gas Tempera- ture Sen- sor 4 Cir- cuit Open Or Short To Bat- tery Volt- age	Signal voltage > 1.72 V	Copyring to the property of the part of th	• 480.0 ms	• 2 DCY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking". page 234 .	With Least
Sen- sor 4			11.60° 146°	M _{ODO A} Q _{DO JOO} JO		DA nagsweallow to hibin	%O``



DTC / Monitor De- scrip- tion Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P246 F Gas Ex- haust Gas Tempera- ture Sen- sor 4 Cir- cuit Plau- sibility Check Check Per- for- manc e Bank Sen- sor 4	Sensor temperature < 230° C Or Temperature difference to other temp sensors during cold start Sedo < 45 K	 Engine run time > 3.0 min ECT > 10° C Simulated sensor temp > 300° C Or Engine off time > 9.0 hrs Decrease of intake air temp after engine start < 5 K Decrease of ambient air temp after engine start < 5 K 	Se or accept and listolling	• 2 DCY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking", page 234 .
P2470 Exhaust Gas flaust Gas Temperature Sensor 4 Circuit Short To Ground Sor Circuit Low Bank 1 Sensor 4	• Signal voltage < 0.45 V	- DA Nagen AG.	• 480.0 ms	• Overectness of Information	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors . Checking", page 234 .

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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure		
P2478 Ex- haust Gas Tem- pera- ture Out Of Rang e Bank 1 Sen- sor 1	Exhaust Gas Tempera- ture Sen- sor 1 Cir- cuit Out Of Range	Control deviation Au K Solution in the state of the sta	 Regeneration from PM trap = On Temperature of upstream particulate matter trap > 100 °C and < 410 °C temperature downstream particulate matter trap < 295° C Fuel quantity > 10 and/or < 45 mg/stroke Engine speed > 1100 and/or < 3500 RPM ECT > 25° C and/or < 70° C torque > 50 Nm and/or < 300 Nm Gear > 2 Ambient temperature > -10° C Baro > 750 hPa 	• 30.0 s		- Check the Exhaust Gas Temperature Sensors . Refer to 3.6.15 Exhaust Gas Temperature Sensors . Checking", page 234 .		
P247 A Ex- haust Gas Tem- pera- ture Out Of Rang e Bank 1 Sen- sor 3	Exhaust Gas Tempera- ture Sen- sor 3 Cir- cuit Out Of Range	 Control deviation > limit from map Or < Limit from Map f (engine speed, torque) 	 Regeneration from PM trap = On Upstream turbine temperature > 450° C Desired post injection > 5.0 mg/stroke Fuel quantity > 3.0 mg/stroke Engine speed 1,250 - 4,000 RPM ECT between 20 - 115° C Veh speed > 35 km/h 	• 30.0 s	• 1 DCY	- Check the Exhaust Gas Temperature Sensors . Refer to ⇒ "3.6.15 Exhaust Gas Temperature Sensors , Checking", page 234 .		



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2563 Tur- bo- charg- er Boost Con- trol Posi-	Pressure Actuator Position Sensor Circuit Range / Perform- ance	Signal voltage > 4.5 V and/or < 0.3 V		• 480.0 ms	• 2 DCY	- Check the Charge Pressure Actuator Position Sensor - G581 Refer to ⇒ "3.6.6 Charge Air Pressure Ac-
tion Sen- sor "A" Circuit Rang e/ Per- for-	Charge Pressure Actuator Position Sensor Circuit Desired Range (Closed)	Signal voltage > 1.72 V and/or < 0.3 V O.3 V Ses authorised by Volkswagen A Ses authorised by Volkswagen B Ses authorised by Volkswagen B	 Engine = running Desired position of Turbo charger actuator = 100.0% Battery voltage > 10.7 V Ambient pressure signal > 733.0 hPa Time after Start > 40,000.0 ms 	• 200.0 ms	• 2 DCY	tuotor Dooi
P2564 Tur- bo-	Charge Pressure Actuator Position Sensor Circuit Short To Ground	• Signal voltage < 0.15 V		ms , is	prrectness of information in this occ.	- Check the Charge Pressure Actuator Position Sensor - G581 Refer to ⇒ "3.6.6 Charge Air Pressure Actuator Position Sensor G581, Checking", page 216.
P2565 Turbo- charger Boost Control Position Sensor "A" Circuit High	Charge Pressure Actuator Position Sensor Circuit Open Or Short To Battery Voltage	• Signal voltage > 4.85 V ໃຊ _{ກອງວອງວ}	. ЭА пэргигэл	• ×480.0 ms	• 2 DCY	- Check the Charge Pressure Actuator Position Sensor - G581 Refer to ⇒ "3.6.6 Charge Air Pressure Actuator Position Sensor G581, Checking", page 216.

DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P2610 ECM/ PCM En- gine Off Timer Per- for- manc e	PCM In- ternal En- gine Off Timer Perform- ance	• Quantity count over time threshold < 7.52 or > 8.48 s	Engine offPower on reset	• 24.0 s. in key Off po- sition	• 2 DCY	Replace the Engine Control Module - J623- Refer to the Repair Manual for procedure.
P2632 Fuel Pump "B" Con- trol Cir- cuit / Open	Auxiliary In-line Fuel Pump Circuit Open	• Signal current < 0.8 mA	Fuel pump com- manded off	480.0 ms • Continuous	• 2 DCY	- Check the Fuel Pump Relay 2 - J49- / Fuel Pump 2 - V277 Refer to ⇒ "3.6.22 Fuel Pump Relay 2 / Fuel Pump 2 , Checking", page 248 .
P2633 Fuel Pump "B" Con- trol Circuit Low	Auxiliary In-line Fuel Pump Circuit Short To Ground	• Signal voltage < 2.0 V	Fuel pump commanded off Indiana The search of the	480.0 ms • Continuous	• 2 DCY	- Check the Fuel Pump Relay 2 - J49- / Fuel Pump 2 - V277 Refer to ⇒ "3.6.22 Fuel Pump Pues Relay 2 / Fuel Pump 2 , Checking", page 248
Fuel Pump "B" Con- trol	Auxiliary In-line Fuel Pump Circuit Short To Battery Voltage	• Signal current > 1.0 A	Fael pump commanded on	 270.0 – 480.0 ms Continuous 	• 2 DCY	- Check the Fuel Pump Relay 2 - J49- / Fuel Pump 2 - V277 Refer to ⇒ "3.6.22 Fuel Pump Relay 2 / Fuel Pump 2 , Checking", page 248 .

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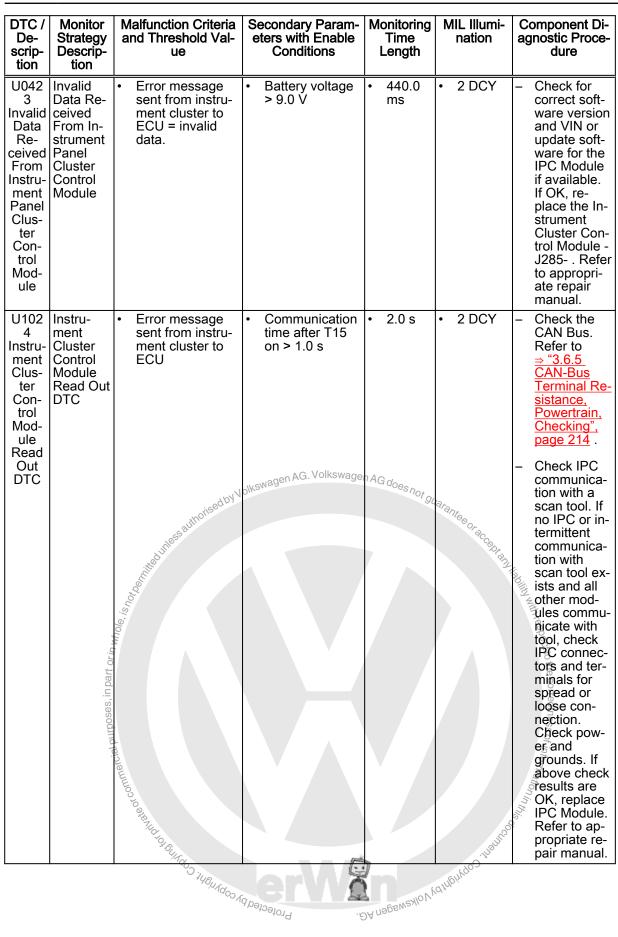


DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
P268 A Fuel Injector Calibration Not Learn ed/ Programmed	Fuel In- jectors Calibra- tion Not Learned / Program- med	Accumulated global release time of zero fuel calibration but disabled by rail pressure deviation > 35.0 s		• ≤ 1 UDC Cycle • Contin- uous	• 2 DCY	Replace the Engine Control Module - J623 Refer to appropriate repair manual.
U000 1 High Speed CAN Com- muni- cation Bus	High Speed CAN Commu- nication Bus	CAN driver A status Bus Off.	Engine running	• 200.0 ms	• 2 DCY	- Check the CAN Bus. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214.
U000 2 High Speed CAN Com- muni- cation Bus Per- for- manc e	High Speed CAN Commu- nication Bus Per- formance	CAN driver A status no communication munication Morised by Volkswagen AG. V	Engine running olkswagen AG does not 944	• 240.0 ms	• 2 DCY	- Check the CAN Bus. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214.
9 Vehicle Communi- cation Bus & Perifori manc	Vehicle Commu- nication Bus A Perform- ance	CAN driver B status no com- munication	Engine running	• 440.0 ms	ability with respect to the co	- Check the CAN Bus. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214.
mercial purposes.				180 jaalingo	orrectness of information in this co	

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DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi ² nation	Component Diagnostic Procedure
U010 1 Lost Com- muni- cation With TCM	Commu-	• Message from ABS module =	Engine running	• 440.0 ms	• 2 DCY	- Check the CAN-Bus terminal resistance between the Transmission Control Module to the Engine Control Module - J623 Refer to 3 * 3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214
U012 1 Lost Communication With Anti-Lock Brake System (ABS) Control Module "A"	nication With Anti- Lock	Message from ABS module = missing	• Engine running	440.0 ms	2 DCY	- Check the CAN Bus. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214 .
U014 6 Lost Com- muni- cation With Gate- way "A"	Lost Commu- nication With Gateway "A"	Fault message from gateway module = true		• 240.0 ms	• 2 DCY	- Check the CAN Bus. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214.
U015 5 Lost Communication With Instrument Panel Cluster (IPC) Control Module	Lost Commu- nication With In- strument Panel Cluster (IPC) Control Module	Fault messages received from In- strument cluster	Engine running	• 440.0 ms	• 2 DCY	- Check the CAN Bus. Refer to ⇒ "3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214.



DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	Component Diagnostic Procedure
U030 2 Soft- ware In- com- pati- bility With Trans- mis- sion Con- trol Mod- ule	Software Incom- patibility With Trans- mission Control Module	Fault message from automatic transmission module.	• Engine running	• 440.0 ms	• 2 DCY	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module. Refer to appropriate repair manual.
Data Re-	From Trans-	Wrong TCM messages received. Word in bart or in whole is a possible of the control of the	Engine running	• 440.0 ms	• 2 DCY	- Check for software updates and TSB's. Reprogram as necessary. If none are found, replace the Transmission Control Module. Refer to appropriate repair manual.
U041 5 Invalid Data Re- ceived from Anti- Lock Brake Sys- tem (ABS) Con- trol Mod- ule "A"	Invalid Data Re- ceived From An- ti-Lock Brake System Control Module	messages sent. Veh speed > 320 km/h or missage	• Engine running	. 500.0 ms	· 2 DCY	- Check the CAN Bus Refer to 3.6.5 CAN-Bus Terminal Resistance, Rowertrain, Checking", page 214. - Check the vehicle speed signal. Refer to 3.6.33 Vehicle Speed Signal, Checking", page 272.





	DTC / De- scrip- tion	Monitor Strategy Descrip- tion	Malfunction Criteria and Threshold Val- ue	Secondary Parameters with Enable Conditions	Monitoring Time Length	MIL Illumi- nation	agnost	onent Di- tic Proce- lure		
6, is not be	U102 C ESP Read Out DTC	Lost Commu- nication With Anti- Lock Brake System (ABS) Control Module		• Engine torque > 120.0 Nm	ON HOBILITY WITH I	• 2 DCY	CAI Ref = "3 CAI Terr sista Pov Che	eck the N Bus. er to 3.6.5 N-Bus minal Re- ance, vertrain, ecking", le 214.		
commercial purposes, in part or in whole, is hotbe	3.5	Tran	smission DTC T	ables	espect to the c					
ses, in p		.5.1 Transı	mission Control Modu	ule , 6-spd 09G", page	orrectness					
ial purpo	◆ ⇒ "3.5.2 Transmission Mechatronic , DSG 6-spd 02E", page 167									
mmerc	3.5.1 Transmission Control Module , 6-spd 09G									
03 70	DTC	Foult	Monitor Street Ma	AQ-250 09G	Thin to	don/ Do N	1onitor	Eroguen		

3.5.1

	Control Module				NWITH TO			ecking", e 214			
<u>151</u>	 → "3.5.1 Transmission Control Module , 6-spd 09G", page 151 → "3.5.2 Transmission Mechatronic , DSG 6-spd 02E", page 167 3.5.1 Transmission Control Module , 6-spd 09G 										
			AQ-	250 09G	n _{in t}						
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	rame Enabl	ters with i	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum			
P0604	Internal Control Module Random Access Memory (RAM) Error	• RAM area check	Compari- son of writing da- ta and reading data	ta is different from reading one		•	40.0 s	• 2 DCY			
P0605	Internal Control Module Read On- ly Memo- ry (ROM) Error	ROM area check	Comparison of stored checksum value and calculated checksum	Two checksu values a not same	re	•	40.0 s	• 2 DCY			
P0613	TCM Processor	2nd CPU detects miscalcula- tion	Check-cal- culation of 1st CPU failed	Single reset does not cove problem		•	XX s	• 2 DCY			
P0614	ECM/TC M Incom- patible	CAN re- ceive data check	Detection of error signal	Transmis sion cod ing is manual transmis sion cod (0Fh) Max torque is no same as one in A CU	- AC muli AC AC TIV	N bus: TIVE U com- nication: TIVE U data late: AC- E	250.0 ms	• 2 DCY			

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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum				
P0705	Trans- mission Range Sensor "A" Cir- cuit (PRNDL Input)	A, B, C and PA signal check in ev- ery shift lever posi- tion.	Detection of wrong combina- tion of the A, B, C and PA signal	Wrong combina- tion for more than 350.0 ms		• 350.0 ms	• 2 DCY				
P0715	Input Tur- bine/ Speed Sensor "A" Circ	Electrical check	Detection of wrong input AD value	 Voltage < 0.2 volt (AD value < 45) for more than 100.0 ms Or (AD value > 545) voltage > 3.8 volt for more than 100.0 ms 	Input sensor: no failure decision for input sensor no pulse fail- ure	• 100.0 ms • 5 times	• 2 DCY				
P0716	Input/ Turbine Shaft Speed Sensor "A" Cir- cuit Range/ Perform- ance	No pulse check	Comparison pulse of input revolution and output revolution and output revolution The standard s	No pulse of input sensor more than 125.0 ms KSWagen AG. Volks Voltage <	Engine speed > 400 RPM Output sensor: ACTIVE Output speed ≥= 300 RPM Input sensor: no during failure detection or after failure decision for input sensor electrical failure	• 125.0 ms • 4 times	• 2 DCY				
P0720	output Shaft Speed Sensor Circuit	che tred in parposes, in part che che transfer the check of the commercial purposes.	of wrong input AD value	0.2 volt (AD value < 45) for more than 100.0 ms Or (AD value > 545) voltage > 3.8 volt for more than 100.0 ms	sor: no fail- ure decision for output sensor no pulse	• 100.0 ms • 5 times	Ct Stine correctness of information in this of				
	Tourndo Tourndo Tourndo Tourndo Tuesta Tourndo Tues										
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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0721	Shaft	No pulse check	Comparison pulse of input revolution and output revolution	No pulse of output sensor more than 250.0s	 Engine speed: > 400 RPM Input sensor: ACTIVE Calculated output speed 	• 250.0 ms • 2 times	• 2 DCY
			adunes sauthor	sed by Volkswage III	speed: >= do 300 RPM • Main sole- noid switch: ON	es not guarante	Oracceptan,
			s not bernii.		 Gear condition: Engage Range: D.S. 		Y liability #
		orin w.h.c.	, 9(b)		Inhibitor switch: no fault		
		, mal purposes, in part	Commerce		RPM Input sensor: ACTIVE Calculated output speed: Speed: >= 300 RPM Main solenoid switch: ON Gear condition: Engage Range: D,S Inhibitor switch: no fault Output sensor: no during failure detection or after failure decision for output sensor electrical failure		S S S W W W W W W W W W W W W W W W W W
			to steally to to		Solenoid: no fault (except S2)		Sinto Salaria
			in Copylips	Pius de la company de la compa	Linear sole- noid: no fault	100 CO 10 10 10 10 10 10 10 10 10 10 10 10 10	
P0725	Engine Speed In- put Cir- cuit	CAN re- ceive data check	Detection of error signal	Protected by copyrig	CAN bus: ACTIVE ECU communication: ACTIVE	.+-\/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	• 2 DCY
					ECU data update: AC- TIVE		

AQ-250 09G	
DTC Fault Code De- scription tion Malfunction Criteria Threshold Value Secondary Pa- properties of Criteria Secondary Pa- properties of Criteria Value Secondary Pa- properties of Criteria Secondar	cy of checks, MIL Illum
Portion Port	• 2 DCY • Cumulative Gdoesnot guara



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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Nage Threshold /age Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0731	Incorrect Ratio	Input and output rpm signal sign	son of in- dicated slip and actual slip	• ABS (input rev – output rev x other gear ratio) < (0.04 x other gear ratio x output rev) for more than 1.0 s	speed > 400 RPM Output revolutions > 250 RPM Estimated engine torque > 100 Nm at 1st gear > 80 Nm at 1st EB gear Shift lever D or S Brake: OFF Slip difference of output speed and ABS difference <	• Ray 0 s • 12 mes	2 D C ula ve to the correctness of information in a straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the correctness of information in the straight respect to the st

		Scan Tool - Editio		250 09G			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Neutral condition check	Detection of slip condition The state of the state	lutions > output revolutions x 1st gear ratio + 400 RPM for more than 3.3 s	 Engine speed > 400 RPM Shift lever D or S Output revolutions <= 500 RPM Output revolutions which <= 500 rpm calculated from ABS (In case of ABS failure, this condition isn't activated) L-up condition: OFF Input sensor, no back up condition Output sensor, active or sor, active or back up by ABS Model oil temperature >= 0° C Common parameter, 	• 2 times	2 DCY Cumulative but, in case of changing the shift lever position, counter = 0
		whole, is not b			rameter, common condition (see foot- note ⇒ page 166)		ability with respect to
		or commercial purposes, in part prin	indiagoo, jugundoo,	$A_{Q,D_{\partial_1}D_{\partial_1}D_{\partial_1}}$	sor, active or swa back-up by ABS • Model oil temperature >= 0° C • Common parameter, common condition (see footnote ⇒ page 166)	Kayufundo Jiya	the correctness of information in this or out.

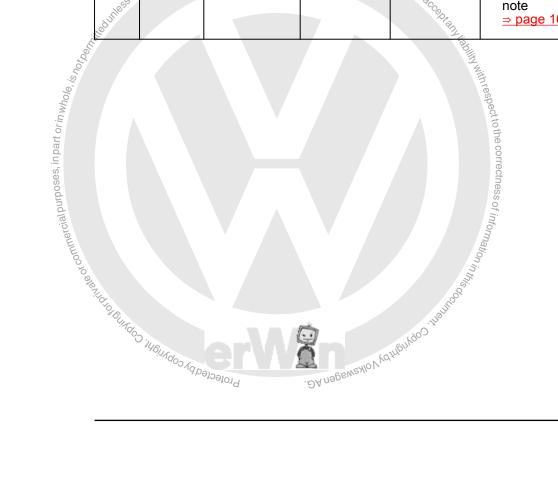


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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0732	Incorrect Ratio	Neutral condition check Neutral condition check **Neutral condition check** **Thorised by VolksWilliams** **Thoris	Detection of slip condition AG. Volkswage Gen AG. Volkswage	Input revolutions > output revolutions x 1st gear ratio + 400 RPM for more than 3.3 s Anagadoes not guara,	 Engine speed > 400 RPM Shift lever D or S Output revolutions <= 	• 2 times	2 DCY Cumulative but, in case of changing the shift lever position, counter = 0
.i		Sour Manago Value Coops			• Output revolutions which <= 500 RPM calculated from ABS (In case of ABS failure, this condition isn't activated) • L-up condition: OFF • Input sensor, no back up condition • Output sensor, active or back up by ABS • Model oil temperature >= 0° C • Common parameter, common condition (see footnote >> page 166)		
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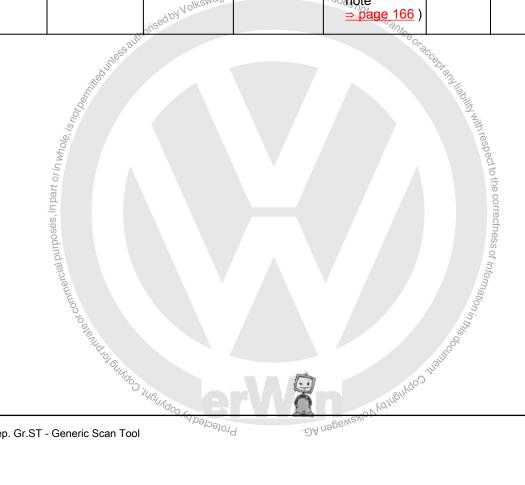
			AQ-	250 09G			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	orcommercial purposes, in part or in whole, is not or	Input and output RPM signal check. Separate error memory for each gear, to each gear, to have a support of the separate and the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear, to have a support of the separate error memory for each gear. **The separate error memory for each gear error memory	• Comparison of indicated slip and actual slip with stored values	1. ABS (in-put revolutions – output revolutions x other gear ratio) < (0.04 x other gear ratio x output revolutions) for more than 1.0 s 2. slip differences > (0.20 x current gear ratio x output revolutions) for more than 1.0 s	speed > 400 RPM Output revolutions > 250 RPM Shift lever D or S Brake: OFF Slip difference of output speed (In case ABS valid) difference < 10.0% Revolution sensor, no back up condition Model oil temperature >= 0° C Common parameter, common condition (see foot note page 166)	• 1.0 s • 12 times	• 2 DCY • Cu- mula- tive
			Protect	. ĐA napeiv.			



			AQ-	250 09G			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0733	Incorrect Ratio	Input and output RPM signal check. Separate error memory for each gear. Magen AG. Volkswa	Comparison of indicated slip and actual slip with stored values Gen AG does not gual	1. ABS (input revolutions – output revolutions x other gear ratio) < (0.04 x other gear ratio x output revolutions) for more than 1.0 s 2. slip differences > (0.20 x current gear ratio x output revolutions) for more than 1.0 s	speed > 400 RPM Output revolutions > 250 RPM Shift lever D or S	• 1.0 s • 12 times	• 2 DCY • Cu- mula- tive



			AQ-	250 09G			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0734	Gear 4 Incorrect Ratio	Input and output RPM signal check. Separate error memory for each gear.	Comparison of indicated slip and actual slip with stored values Online ad by Volkewager online ad by Volkewager souls and the control of the control o	1. ABS (input revolutions – output revolutions x other gear ratio x other gear ratio x output revolutions) for more than 1.0 s 2. slip differences > (0.20 x current gear ratio x output revolutions) for more than 1.0 s	speed > 400 RPM Output revolutions > 250 RPM Shift lever D or S Brake: OFF Slip difference of output speed (In case ABS valid) difference < 10.0% Revolution sensor, no back up condition Model oil temperature >= 0° C Common parameter, common condition	• 1.0 s • 12 times	• 2 DCY • Cu- mula- tive





			AQ-	250 09G			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0735	Incorrect Ratio	Input and output RPM signal check. Separate error memory for each gear. Input AD value shock.	Comparison of indicated slip and actual slip with stored values Sikewagen AG. Volks Si	• 1. ABS (input revolutions – output revolutions x other gear ratio x other gear ratio x output revolutions) for more than 1.0 s • 1. ABS (input revolutions x other gear ratio x output revolutions) for more than 1.0 s	speed > 400 RPM Output revolutions > 250 RPM	• 1.0 s • 12 times	• 2 DCY • Cu- mula- tive
P0743	er Clutch Circuit	in every Linear sole-	input AD value	Feedback current > 1,333.0 mA (AD value > 1,000.0) for more than 100.0 ms Feedback current < 23.0 mA (AD value < 15) for more than 100.0 ms	Mandoo jilahtoo da	• formalion ms • 5 • times	• 2 DCY
		Linear sole- noid feed- back cur- rent check	Comparison of target current and feedback current rent	• Sum of difference of two current > 20,000.0	 Linear feed- back current is > 23.0 mA (AD:15) < 1,333.0 mA (AD:1,000.0) 	• 2 times	• 2 DCY • Continu- ously

			AQ-	250 09G			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0748	Pressure Control Solenoid "A" Elec- trical	Input AD value check in every Linear solenoid.	Detection of wrong input AD value	Feedback current > 1,333.0 mA (AD value > 1,000.0) for more than 100.0 ms Feedback current < 23.0 mA	Main sole- noid switch:	• 100.0 ms • 5 times	• 2 DCY
				23.0 mA (AD value < 15) for more than 100.0 ms	ON	_	
		Linear sole- noid feed- back cur- rent check	Comparison of target current and feed back current rent		lkswback_current	• 2 times	×/~
P0753	Shift Sol- enoid "A" Electrical	Conduction check in ON/OFF solenoid. ON/OFF solenoid. ON/OFF solenoid. ON/OFF solenoid.	• Comparison of the signal of solenoid monitor and solenoid driver output	Wrong output sig- nal for more than 100.0 ms		• 100.0 ms	2 DC William With respect to the
P0798	Pressure Control Solenoid "C" Elec- trical	Input AD value check in every Linear sole-noid.	Detection of wrong input AD value	• Feedback current > 1,333.0 mA (AD value > 1,000.0) for more than 100.0 ms		• 100.0 ms • 5 times	• COLLECTIONS OF INFORMATION IN THIS COUNTY OF THE PROPERTY OF
		© ×	Comparison of tar-	• Feedback current < 23.0 mA (AD value < 15) for more than 100.0 ms	Main sole- noid switch: ON	Maydundoo il	This is a second of the second
		Linear sole- noid feed- back cur- rent check	Comparison of target current and feedback current	• Sum of difference of two current > 20,000.0	 linear feed- back current is > 23.0 mA (AD:15) < 1,333.0 mA (AD:1,000.0) 	• 2 times	2 DCY Continuously



P0811 Ex	Fault ode De- cription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks,
siv	xces-				10113		MIL IIIum
"A	ve lutch A" Slip- age	OFF stuck check.	Comparison of engine RPM and input RPM	• Engine RPM – in- put RPM > 100 RPM for 2.0 s	Engine speed > 400 RPM Shift lever D or S Engine speed < 4,000 RPM Estimated engine torque >= 0 Nm Revolution sensor, no back up condition SLU target current >	• 2.0 s • 6 times	2 DCY Continuously
			Hill Bass	umońsed by Volkswa	1,000.0 mA • Model oil temperature gen A≥=√20% Ggen A • Common parameter, common	G does not gu _ä	fantee Orac Reptal.
Co nic Cii Ra Pe	CM ommu- ication ircuit ange/ erform- nce	CAN communication check	• detection of communication of communication where (all frames which are entered in ATCU)	communi- cation for more than 50 ms (In case of re-	CAN bus: ACTIVE time: 500 ms after ignition: ON	• 500.0 ms (In case of re peat rate is over 50.0 ms, 10 times value of repeat rate is used)	• 2 DCY

				250 09G			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
			Detection of communication error (one frame which is entered in ATCU)	ECU no communication for more than 50.0 ms (In case of repeat rate is over 25.0 ms, double value of repeat rate is used)	CAN bus: ACTIVE Time: 500.0 ms after ignition: ON ECU communication: not in no communication failure	• 1,000.0 ms (In case of repeat rate is over 50.0 ms, 20 times value of repeat rate is used)	•
		CAN receive data check	ECU signal data freeze (data counter (ID488, Byte8, Bit7 – 4) not updated)	Nessauthorised by Voll	CAN bus: ACTIVE CAN data repeat rate: the space of time be- tween two received messages has not ex- ceeded dou- ble the transmission cycle time	No up- date in five mes- sage en AG does no	^t guarantee or a
		CAN com- munication check	Detection of communication errors	No acknowledge condition for more than 300.0 ms	CAN bus: ACTIVE Time: 500.0 ms after ignition: ON	• 300.0 ms	
P0865	TCM Commu- nication Circuit Low	CAN com- munication check	Detection of communication error	CAN BUS off condi- tion for more than 250.0 ms	Time 500.0 ms after ignition: ON	• 250.0 ms	· 2 DCY
P2122	Throttle/ Pedal Position Sensor/ Switch "D" Cir- cuit Low	CAN communication check	Detection of error signal	RELIAGOS HOUAGOS AGE	CAN bus: ACTIVE ECU communication: ACTIVE ECU data update: ACTIVE	• 250.0 ms	· 2 DCY

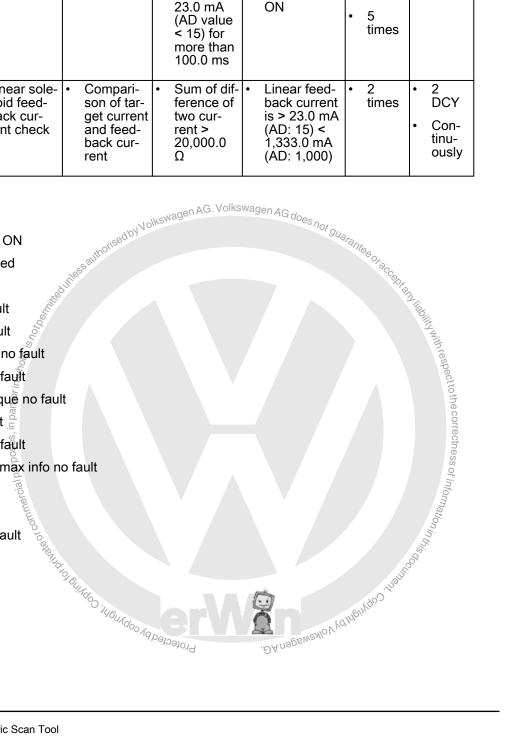


			AQ-	250 09G			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2637	Torque Manage- ment Feed- back Sig- nal "A"	CAN receive data check for "signal invalid"	detection of error signal (0xFF)	_{en} AG. Volkswage <i>n</i>	CAN bus: ACTIVE ECU communication: ACTIVE ECU data update: ACTIVE AGGOGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGGG	• 250.0 ms	• 2 DCY
P2716	Pressure Control Solenoid "D" Elec- trical	Input AD value check in every Linear sofenoid. **The control of the character of the	Detection of wrong input AD value	• Feedback current > 1,333.0 mA (AD value > 1,000.0) for more than 100.0 ms	9uarantee	• 100.0 ms 5 times	• 2 DCY
		Finear sole-noid. Sold in part or in whole is not sold in the sold		• Feedback current < 23.0 mA (AD value < 15) for more than 100.0 ms	Main sole- noid switch: ON	• 100.0 ms • 5 times	2 DCY
		noid feed- back cur- rent check	Comparison of target current and feedback current rent	• Sum of difference of two current > 20,000.0	 Linear feed-back current is > 23.0 mA (AD: 15) < 1,333.0 mA (AD: 1,000.0) 	• 2 times	Continuously
P2725	Pressure Control Solenoid "E" Elec- trical	Input AD value check in every Linear solenoid.	Detection of wrong input AD value, polypoly	• Feedback current > 1,333.0 mA (AD value > 1,000) for more than 100.0 ms	лабилья Лонкемедепу Мемедепублика	• 5 times	• 2 DCY
				Feedback current < 23 mA (AD value < 15) for more than 100 ms	Main sole- noid switch: ON	• 100.0 ms • 5 times	• 2 DCY
		Linear sole- noid feed- back cur- rent check	Comparison of target current and feedback current	• Sum of difference of two current > 20,000.0	 Linear feed-back current is > 23.0 mA (AD: 15) < 1,333.0 mA (AD: 1,000.0) 	• 2 times	2 DCY Continuously

		AQ-	250 09G			
Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
Pressure Control Solenoid "F" Elec- trical	Input AD value check in every Linear solenoid.	Detection of wrong input AD value	Feedback current > 1,333.0 mA (AD value > 1,000) for more than 100.0 ms Feedback current < 23.0 mA	Main sole- noid switch: ON	• 100.0 ms • 5 times • 100.0 ms	· 2 DCY
	Linear sole- noid feed- back cur- rent check	son of tar- get current and feed-	(AD value < 15) for more than 100.0 ms • Sum of dif- ference of two cur- rent >	Linear feed- back current is > 23.0 mA (AD: 15) <	• 5 times	• 2 DCY • Con- tinu-
	Code Description Pressure Control Solenoid "F" Elec-	Pressure Control Solenoid "F" Electrical • Linear solenoid feedback cur-	Fault Code Description Pressure Control Solenoid "F" Electrical • Linear solenoid eedback cur- • Linear soles on of target son of target son of target current	Pressure Control Solenoid "F" Electrical Solenoid "F" Electrical Criteria Criter	Fault Code Description Pressure Control Solenoid "F" Electrical **Threshold Value** **Input AD value check in every Linear solenoid.** **Input AD value > 1,333.0 mA (AD value > 1,000) for more than 100.0 ms **Input AD value > 1,333.0 mA (AD value < 15) for more than 100.0 ms **Input AD value > 1,300) for more than 100.0 ms **Input AD value > 1,300 for more than 100.0 ms **Input AD value > 1,300 for more than 100.0 ms **Input AD value > 1,300 for more than 100.0 ms **Input AD value > 1,300 for more than 100.0 ms **Input AD value > 1,300 for more than 100.0 ms **Input AD value > 1,300 for more than 100.0 ms **Input AD value > 1,300 for more than 100.0 ms **Input AD value > 1,300 for more than 100.0 ms **Input AD value > 1,000 for more than 100.0 ms **Input AD value > 1,300 for m	Fault Code Description Pressure Control Solenoid "F" Electrical Linear solenoid feedback current check Comparizent chec

Footnote:

- main solenoid switch ON
- gear condition engaged
- S1 solenoid No fault
- linear solenoid no fault
- inhibitor switch no fault
- CAN communication no fault
- ECU data update no fault
- estimated engine torque no fault
- engine speed no fault
- accelerator pedal no fault
- T/M coding and MDI max info no fault
- ROM no fault
- RAM no fault
- safety processor no fault





3.5.2 Transmission Mechatronic , DSG 6-spd 02E

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0219	Engine Over- speed Condition	Signal range check	Rotational speed of gearbox input shaft exceed a maximum value	• Rotational speed> 12,000 RPM	Terminal 15° voltage > 4.0 V for more than 500.0 ms	***500.0	• 2 driving cycles
P0501	Vehicle Speed Sensor "A" Cir- cuit Range/ Perform- ance	Plausibility check Plausibility chec	the calcu- lated speed with measured speed of	• Speed difference magnitude > 330 RPM (output speed = 500 RPM) - 100 RPM (output speed >= 2,000 RPM)	 Gear on input shaft engaged No valid CAN output speed information Output speed > 25 RPM Or speed of input shaft > 1,000 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• 300.0 ms	• 2 drivating ing cycles
P0701	Trans- mission Control System Range/ Perform- ance	Ssignal range check	 Travel sensor voltage gearshift fork 1/3 out of plausibility range Travel sensor voltage gearshift fork 2/4 out of plausibility range 	 Voltage < 100.0 mV Or Voltage > 4,900.0 mV 		• 300.0 ms	• 2 driving cycles

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$\overline{\Box}$				DQ-2	50 6F 02E			Oracco	.
С	OTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	(A)
P(0702	Trans- mission Control System Electrical	Plausibility check	Travel sensor voltage gearshift fork 5/N out of plausibility range Travel sensor voltage gearshift fork 6/R out of plausibility range In spite of cut off Common High-side Switch 1 a measurable current. In spite of turned on Common High-side Switch 1 no current measurable.	• CHS1 cut off and CHS124 Current > 40.0 mA CHS1 turned on and CHS1 - Current < 200.0 mA	One-time after reset	• 300.0 ms	2 driv- wing	



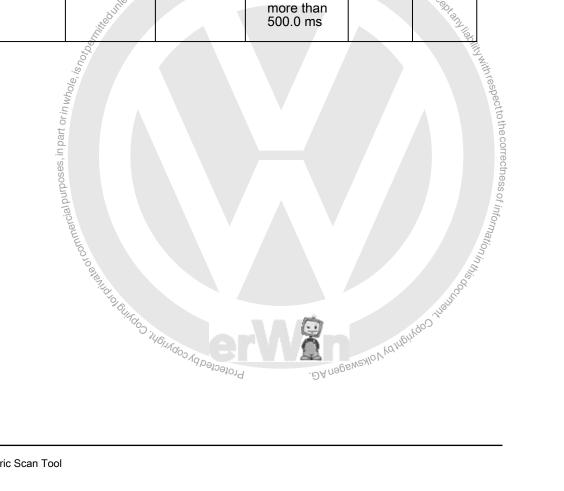
Code Description egy Description Criteria Value rameters with Enable Conditions Crycle Check MilL III				DQ-2	50 6F 02E			
cut off Common High-side Switch 2 a measurable current ln spite of turned on Common High-side Switch 2 an current measurable. In spite of cut off Common High-side Switch 2 an current measurable. In spite of cut off Common High-side Switch 3 an courrent measurable. In spite of cut off Common High-side Switch 3 an courrent measurable. In spite of cut off Common High-side Switch 3 an courrent measurable. CHS3 current CHS4 current Common Common Common High-side Switch 3 current CHS4 current CHS4 current CHS5 current	DTC	Code De-	egy Descrip-			rameters with Enable Condi-	ing Time	Frequen- cy of checks, MIL Illum
deactivated by module 2			_	cut off Common High-side Switch 2 a measura- ble cur- rent. In spite of turned on Common High-side Switch 2 no current measura- ble. In spite of cut off Common High-side Switch 3 a measura- rent. In spite of turned on Common High-side Switch 3 no current measura- ble.	off and CHS2 - Current > 40.0 mA CHS2 turned on and CHS2 - Current < 200.0 mA CHS3 - Current > 40.0 mA CHS3 - Current > 200.0 mA CHS3 - Current > 200.0 mA	 ter reset Terminal 15 voltage < 18.0 V No short-circuit current check failure of CHS 2 Common high-side switch 2 voltage > 9.2V Gearbox subsystem 2 active Common high-side switches not deactivated by module 2 One-time after reset Terminal 15 voltage < 18.0 V No short-circuit current check failure of CHS3 and main pressure solenoid valve Common high-side switch 1 and 2 voltage > 9.2 V Common high-side switches not deactivated switches not deactivated		0
Switches not deactivated by module 2			James of Commercial States of	Protected by copyrig	.∂An	соридиру Локемеде	nmation in this cook, the same of the same	

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0717	Input/ Turbine Shaft Speed Sensor "A" Cir- cuit No Signal	Plausibility check P	Calculate the speed of input shaft 1 with the gear ratio of engaged gear on input shaft 1 and the output shaft 2 with measured speed with measured of input shaft 1 Calculate the speed of input shaft 1 Calculate the speed of input shaft 2 with the gear ratio of engaged gear on input shaft 2 and the output shaft speed. compare the calculated speed with measured speed of input shaft 2	RPM)	 Gear engaged on input shaft 1 Valid CAN output speed information Speed of input shaft 1 < 25 RPM Qutput speed > 25 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms Gear engaged on input shaft 2 Valid CAN output speed information Speed of input shaft 2 Valid CAN output speed information Speed of input shaft 2 Valid CAN output speed information Speed of input shaft 2 FRM Terminal 15 voltage > 4.0 V for more than 500 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• 900.0 ms	2 driving cycles - correctness of inform - correctness of inform



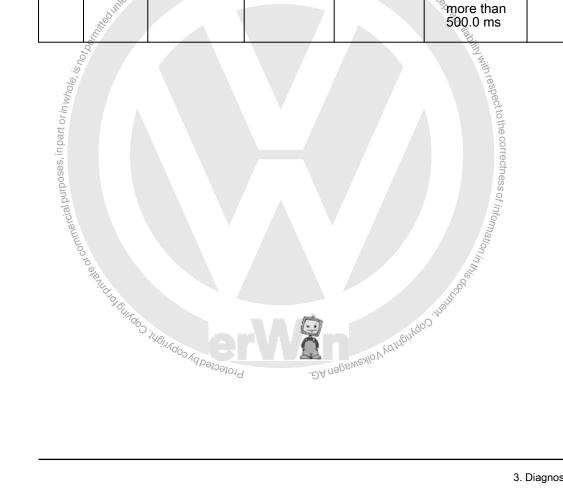
			by Johnson DQ-2	50 6F 02E	os not gue		
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0729	Incorrect Ratio	Synchronizing detection while the gearshift fork was controlled to engage sixth gear	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing	• Integral > 125	 No slipping point adaptation of clutch 2 Multiplexer position = 0 [-] Control gearshift fork valve 3 >= 5.0% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPMr more than 500.0 ms 	Syn-chron-tip, yerectness of information in this control of the safety of safety value.	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0731	Gear 1 Incorrect Ratio	Synchronizing detection while the gearshift fork was controlled to engage first gear	Integral that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 1	• Integral > 125	 No slipping point adaptation of clutch 1 Multiplexer position = 0 [-] Control gearshift fork valve 1 >= 5.0% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	Syn- chron- izing slip, duty factor of safety valve 1 Ses not guarante Output Companies Compan	• 2 driving cycles





			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0732	Incorrect Ratio	Synchronizing detection while the gearshift fork was controlled to engage second gear oriced by Volkewagen	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2	• Integral > 125	 No slipping point adaptation of clutch 2 Multiplexer position = 1 Control gearshift fork valve 3 >= 5.0% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	Syn-chron-izing slip, duty factor of safety valve 2	• 2 driving cycles



DTC	Fault	Monitor Strat-	Malfunction	50 6F 02E Threshold	Secondary Pa-	Monitor-	Frequen-	
	Code De- scription	egy Descrip- tion	Criteria	Value	rameters with Enable Conditions	ing Time Length	cy of checks, MIL Illum	
	Gear 3 ncorrect Ratio	Synchronizing detection while the gearshift fork was controlled to engage third gear	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 1	Integral > 125 Integral > 125 Still durings authorised Still durings authorised Still durings authorised Still durings authorised Still during a	 No slipping point adaptation of clutch 1 Multiplexer position = 0 [-] Control gearshift fork valve 2 >= 5.0% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more 	Syn-chron-izing slip, duty factor of safety valve 1 kswagen AG of the safety of the	• 2 driving cycles	Se Or accept All All All All All All All All All Al
			ommercial purposes, in part or in whole, is not	0	300.0 ms		AUTON VOKSWE	illa lind of



			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0734 burposes, in part or in whole	Incorrect Ratio		that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing slip and duty factor of the safety valve 2		 Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 cms Engine speed > 600 RPM for more than 500.0 ms 	Syn-chron-izing slip, duty factor of safety valve 2	• 2 driving cycles
	THO TO GUISON	Ojected by Copyright Co	nd . DA	njaurph Nolkswagen	, do) Halling of		

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DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0735	1	Synchronizing detection while the gearshift fork was controlled to engage fifth gear Synchronizing detection while the gearshift fork was controlled to engage fifth gear	414	• Integral > 125	 No slipping point adaptation of clutch 1 Multiplexer position = 1 [-] Control gearshift fork valve 1 >= 5.0% No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 rpm for more than 500.0 ms 	• Synchron-izing slip, duty factor of safety valve 1	• 2 driving cycles



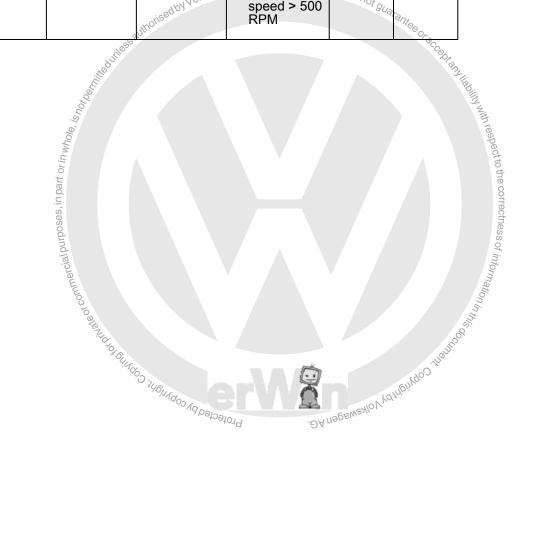
DTC
P0736

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Synchronizing detection while the gearshift fork was controlled to engage reverse gear Pressure Pressure	that corresponds to the energy flux in the synchronization exceeds a maximum value. The integral calculation depends on synchronizing	• Integral > 125	Battery volta	red and liability with respect when) †
P0746	Control Solenoid	Pressure integral monitoring	actual pressure	integral >= 0,1 bar*s	Desired pressure <= adapted clutch slipping point + 1 bar Standing vehicle with accelerator pedal < 0.1% Battery voltage > 9.0 V for more than 500.0 Engine speed > 500 RPM	• 300.0 ms	2 driving cycles



	DQ-250 6F 02E										
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum				
commercial purposes, in part or in whole, is hove.	Pressure	Open-cir- cuit checken orised by Volkey o	• Desired valve cur- rent of clutch 1 exceeds a threshold simultane- ous the actual valve cur- rent is smaller than a second threshold	Desired current > 350.0 mA actual current < 50.0 mA	 Common high-side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high-side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500 0 ms Engine speed > 500 RPM 						
P0747	Control Solenoid "A" Stuck	• Pressure buildup monitoring	The number of successive pressure buildup failure of clutch 1 reaches a maximum value The number of successive pressure buildup failure of clutch 1 reaches a maximum value The number of successive pressure pressure buildup failure of clutch 1 reaches a maximum value The number of successive pressure pressure pressure buildup failure failure failure pressure	• Counter > 2	 Engaged gear on input shaft 1 Desired pressure >adapted clutch slipping point – 0.2 bar Output speed < 200 RPM Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• 0.0 ms	• 2 driving cycles				

	DQ-250 6F 02E									
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum			
		Short-circuit current check	son of ac- tual valve current with de- sired valve current of clutch 1	ms	Common high-side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high-side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500.0 ms Common AG. Volkswagen A Engine speed > 500 RPM	• 200.0 ms	ante _{e Or}			





	DQ-250 6F 02E									
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum			
P0751	Shift Solenoid "A" Performance/ Stuck Off	• Open-circuit check	Comparison of residual current of gearbox subsystem 1 (total current at common high-side switch 1 – actual current of clutch 1) at switch-agening point of control gearshift fork valve 1 with residual current at permanent control of control gearshift fork valve 1 Service of the sidual current at permanent at permanent control of control gearshift fork valve 1	A GRIEGO OF ROCEPHARMATICA PROPERTY OF THE PRO	1 is stable) <= 5.0% Duty factor change of gearshift fork valve 2 (control of gearshift fork valve 2 is stable) <= 5.0% Y factor	• 300.0 ms	• 2 driving cycles			

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0756	enoid "B" Performance of the part or in whole is and the part of t	• Open-circuit check	• Comparison of residual current of gearbox subsystem 1 (total current at common high-sides) witch 1 – actual current of clutch 1) at switching point of control gearshift fork valve 2 with residual current at permanent control of control gearshift fork valve 2	Difference of residual current <= 200.0 mA (supply voltage at common high-side 1.0 = 7.0 mA (supply voltage at common high-side 1.0 = 13.0 V) Dy usbanishout Output Description Output Description Description	 Common high-side switch 1 on, not defect and voltage > 9.2 V Gearbox subsystem 1 active Common high-side switches not deactivated by module 2 Change of supply voltage < 1 V Duty factor change of safety valve 1 (control of safety valve 1 is stable) <= 5.0% Duty factor change of gearshift fork valve 1 is stable) <= 5.0% Duty factor change of gearshift fork valve 1 is stable) <= 5.0% Duty factor change of gearshift fork valve 1 is stable) <= 5.0% Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	for-	• 2 driving cycles



DQ-250 6F 02E								
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	rameters with in	onitor- g Time cy of ength checks, MIL Illum		
P0761	Shift Solenoid "C" Performance/ Stuck Off	Ociit check Oben-ciral purposes, in part or in whole of commercial purposes, in part or in whole of commercial purposes. Oben-ciral purposes, in part or in whole or in part or in whole or in part or	Comparison of residual current of gearbox subsystem 2 (total current at common high-side switch 2 – actual current of clutch 2) at switching point of control gearshift fork valve 3 with residual current at permanent control of control gearshift fork valve 3	Difference of residual current <= 200.0 mA (supply voltage at common high-side 2.0 = 7.0 V) – 450.0 mA (supply voltage at common high-side 2.0 = 13.0 V) Dud To the sidual current of the side 2.0 = 13.0 V)	safety valve	• 2 driving cycles • to the correctness of information in this country in the correctness of the correctnes		

		orised by Volks.	DQ-2	50 6F 02E	Ds.		
DTC	Fault Code De- scription	Monitor Strat-	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0766	enoid "D" Perform- ance/ Stuck Off	• Open-circuit check	Comparison of residual current of gearbox subsystem 2 (total current at common high-side switch 2 – actual current of clutch 2) at switching point of control gearshift fork valve 4 with residual current at permanent control of control of control gearshift fork valve 4	(7)	 Common high-side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem active Common high-side switches not deactivated by module 2 Change of supply voltage 1.0 V Duty factor change of safety valve 2 <= 5.0% (control of safety valve 2 is stable) Duty factor change of gearshift fork valve 3 <= 5.0% (control of gearshift fork valve 3 is stable) Duty factor of control gearshift fork valve 4 > 70.0% and steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 300.0 ms	• 2 driving cycles



			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0771	enoid "E" Perform-	Open-circuit check And the standard of the standard o	Comparison of residual current of central control (total current at common highside switch 3 – actual current of main pressure valve and cooling oil valve) at switching point of multiplexer valve with residual current at permanent control of multiplexer valve	of residual current <= 150.0 mA (maximum of supply voltage at common high-side 1,2 and terminal 15.0 = 7.0 V) – 300.0 mA (maximum of supply voltage at common high-side 1,2 and terminal 15 = 13.0 V)	 Common high-side switch 3 on and not defect No short-circuit current check failure of main pressure solenoid valve Common high-side switch 1 and 2 voltage > 9.2 V Common high-side switches not deactivated by module 2 Change of supply voltage < 1.0 V Multiplexer valve is controled and steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	Rice of acceptantile	with respect to the correctness of information in a

			DQ-2	50 6F 02E]
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	
P0776	Pressure Control Solenoid "B" Per- for- mance/ Stuck Off	Pressure integral monitoring	Integral of actual pressure minus desired pressure minus drain exceeds a maximum value Integral of actual pressure minus drain exceeds a maximum value	integral >= 0.1 bar*s on the state of the st	 Desired G Vollage Sure <= adapted clutch slipping point + 1 bar Standing vehicle with accelerator pedal < 0.1% Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	ms		e of acceptany liability with respect to the control of the contro
		Open-cir- cuit check	Desired valve current of clutch 2 exceeds a threshold simultaneous the actual valve current is smaller than a second threshold	Desired current> 350.0 mA actual current < 50.0 mA	common high-side switch 2 on, not defect and voltage > 9.2 V gearbox subsystem 2 active common high-side switches not deactivated by module 2 terminal 15 voltage > 9 V for more than 500 ms engine speed > 500 rpm	gen AG.	EWZAIOV YEATHER	mation in this object to the state of the st



			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0777	Pressure Control Solenoid "B" Stuck On	check check	The number of successive pressure buildup failure of clutch 2 reaches a maximum value Comparison of actual valve current with desired valve current of clutch 2 Manual Comparison of actual valve current of actual va	sired cur- rent and (actual current- desired current) >	 Engaged gear on input shaft 2 Desired pressure > adapted clutch slipping point - 0.2 bar Output speed < 200 RPM Terminal 15 voltage > 4.0 V for more than 500 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms Common high-side switch 2 on, not defect and voltage > 9.2 V Gearbox subsystem 2 active Common high-side switches not deactivated by module 2 Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM Engine speed > 500 RPM 	• 200.0 ms	ot and liability with respect to the solid

	DQ-250 6F 02E										
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum				
P0781		Unable to disengage the first gear Output Outpu	Gearshift fork of first gear stays in shifted position in spite of control to disengage authorized by a statement of the second of the se	tion > syn- chronizing point first gear +	 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than more than 500.0 ms 	• 6,000.0 ms	in cycles in cycles				
	control to disengage Control to disengage										



			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0782	2-3 Shift	Unable to disengage the second gear . Unable to disengage the second gear . Unable to disengage the second gear. . Una	a difficulty of the second of	Gearshift fork position < synchronizing point second gear - 10.0% synchronizing point gen AG measured by a basic adjustment (second gear stays in shifted position) control gearshift fork valve 4 >= 5.0%	 Control safety valve 1 (ON) >= 20.0% Multiplexer position = 1 Desired main pressure 2 bars No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	• 6,000.0 ms	ing cycles
			TO THE STREET OF	Protected by Ool	-DA N908We	MOV WOTH BY LOOK	Tonin this oo

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Unable to disengage the third gear Seauthoriseaby Volkswa			Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms	ms	• 2 driv- ing cycles
	ammo to alevido of the	INGO SHOIMOONG POROS	and a second	OA nagewayo V Valn	information in the last of the		



DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Parameters with Enable Conditions	Monitor- ing Time Length	Fred Cy che MIL
P0784	4-5 Shift	Unable to disengage the fourth gear Olkswagen AG. Volks	Gearshift fork of fourth gear stays in shifted position in spite of control to disengage Wagen AG does not to the stay of the stay o	adjust- ment (fourth gear stays in shifted position) control gearshift fork valve 3 >= 5.0%	 Desired main pressure > 2 bar No main pressure loss 	ms)• 22 irr
P0791	Inter- mediate Shaft Speed Sensor "A" Cir- cuit	Signal range check	 Rotational speed of input shaft 1 exceed a maximum value Or Rotational speed of input shaft 2 exceed a maximum value 	Rotational speed > 12,000 RPM	Terminal 15 voltage > 4.0 V for more than 500.0 ms	• 100.0 ms	• 2
Senito to late	IAGO IHOUNGOO,	Protected by	Olkswagen AG.	Manufundo inamos			

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
S, in part or in whole, is part	Control Solenoid "C" Stuck	Short-circuit current check Orised by Volkswagen Orised by Volkswagen	son of ac- tual valve current	Actual current>desired current and (actual current-desired current) > 200.0 mA for more than 300.0 ms	high-side switch 3 on and not de- fect Common high-side switch 1 and 2 voltage >	• 300.0 ms	2 driving cycles
mmercial purp		• Unable to disengage the fifth gear	fork of fifth gear stays in shifted position in spite of	Gearshift fork position > synchronizing point fifth gear + 10% synchronizing point measured by a basic adjustment (fifth gear stays sin shifted position) control gearshift fork valve 2 >= 5.0%	 Control safety valve 1(ON) > 20.0% Multiplexer position = 1 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500 ms Engine speed > 600 RPM for more than 500.0 ms 	• 6,000.0 ms	• 2 driving cycles



	DQ-250 6F 02E						
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Solv Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
		Unable to disengage the sixth gear Tradui 'sesodina's. Tradui 'sesodina's. Tradui 'sesodina's. Tradui 'sesodina's.	• Gearshift fork of sixth gear stays in shifted position in spite of control to disengage	• Gearshift fork position > synchronizing point sixth gear + 10.0% synchronizing point measured by a basic adjustment (sixth gear stays in shifted position) control gearshift fork valve 4 >= 5.0%	 Control safety valve 2 (ON) >= 20.0% Multiplexer position = 0 Desired main pressure > 2 bar No main pressure loss Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms 	We Mo Washing	Stand lighting
P0840	Trans- mission Fluid Pressure Sensor/ Switch "A" Cir- cuit	Signal range check	Pressure sensor voltage clutch 1 out of plausibility range	 Voltage < 100.0 mV Or Voltage > 4,900.0 mV 		• 300.0 ms	• 2 driving cycles
P0841	Trans- mission Fluid Pressure Sensor/ Switch "A" Cir- cuit Range/ Perform- ance	overpres- sure moni- toring	Hydraulic pressure of clutch 1 exceeds a maximum value	• Pres- sure>= 15.5 bar	 Signal range check is correct Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 1,000.0 ms	• 2 driving cycles

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0845	Trans- mission Fluid Pressure Sensor/ Switch "B" Cir- cuit	Pressure sensor volt- age clutch 2 out of plausibility range	Pressure sensor voltage clutch 1 out of subject of range	 Voltage < 100.0 mV AG. Olkswagen A Voltage > 4,900.0 mV 	G does not guarantee or	• 300.0 ms	• 2 driv- ing cycles
P0846	Trans- mission Fluid Pressure Sensor/ Switch "B" Cir- cuit Range/ Perform- ance	Overpressing toring of the state of the	Hydraulic pressure of clutch 2 exceeds a maximum value	• Pressure >= 15.5 bar	 Signal range check is correct Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM 	• 80.0 ms	ect to the correctness of int
P0864	TCM Commu- nication Circuit Range/ Perform- ance	Buss off de-	• Detection		Terminal 15 voltage > 9.0 V for more than 500.0 ms 500.0 ms 500.0 ms after reset	• 1,090.0 ms	• 2 driv- ing cycles
P0890	TCM Power Relay Sense Circuit Low	Short-circuit current check	Detection by hard- ware cir- cuit	• Current > 8.5 A	Terminal 15 voltage > 4.0 V for more than 500.0 ms	• 200.0 ms	2 driv- ing cycles



			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P0914	Gear Shift Po- sition Cir- cuit	Time out detection of the question and answer diagnosis	If time out of the question and answer diagnosis is detected increment an event counter	Time out threshold> 100.0 ms AG, Volks	 Gear message for selector lever is transmittable and selector lever message is receivable No failure of selector lever CAN messages Time after reset > 100.0 ms Terminal 15 voltage > 4.0 V for more than 500.0 ms 	• 300.0 ms	• 2 driving cycles
		Plausibility check of selector lever Office of commercial barrors of the property of the	lever position is not equal to negation of the inverse selector lever position Or Selector lever position	Selector lever position == Position 1 or Position 2 or Position 3 or Position 4 or Position L	V for more than 500.0 ms Vagen Ac No bus off error No error failure of all CAN messages No failure of selector lever CAN messages Time after reset > 1,100.0 ms Terminal 15 voltage > 9.0 V for more than 1,100.0 ms		ectness of information in the

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	authorise	Question and answer diagnosis	Failure of question and ans does swer diag- nosis	not guarantee		• 1,500.0 ms	
P0919	Gear Shift Po- sition Control Error	Evaluation the error signal of selector lever CAN message Validity check of selector lever position Agpagagagagagagagagagagagagagagagagagaga	Error flag of not de- terminable selector lever posi- tion is set If the se- lector lev- or position	\$CCO.	er CAN messages Terminal 15 voltage > 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM No failure of selector levage of CAN mose	• 20.0 ms	• 2 driving cycles



			DQ-2	50 6F 02E				
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum	
		Error detection of the question and answer diagnosis	If the answer of the diagnosis is wrong an event counter is incremented		No failure of selector lev- er CAN mes- sages Terminal 15 voltage > 4.0 V for more than 500.0 ms	• 100.0 ms		
		Plausibility check of selector lever position	If the selector lever position is not equal to negation of the inverse selector lever position equals initialization value but the initialization flag is not set Selector lever position equals error value then increment an event counter		No failure of selector lever CAN messages Terminal 15 voltage ≥ 4.0 V for more than 500.0 ms Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM	• 400.0 ms	Quarantee Or acce	Transline.
P0929	Gear Shift Lock Sol- enoid/ Actuator Control Circuit "A" Range/ Perform- ance	Validity check of shiftlock po- sition signal	If the shift- lock posi- tion signal is not valid (position! = error, deactive, active or init) incre- ment an event counter	HADO HABINADOS NA PO	No failure of selector lever CAN messages Terminal 15 V for more than 500.0 ms	• 20.0 ms	• 2 driving to cycles	JICO Y

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2711	Unexpected Mechanical Gear Disengagement	Unable to engage a gear on shaft 1	The number of successive engagements of the same gear on shaft 1 exceeds a maximum value The number of successive engagements of the same gear on shaft 1 exceeds a maximum value The number of the number of successive engagements of the same gear on shaft 1 exceeds a maximum value The number of successive engagements of successive engagements of the same gear of the same gea	• coun- ter>=6	Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms	• 0.0 ms	• 2 driv- ing cycles
		Unable to engage a gear on shaft 2	The number of successive engagements of the same gear on voluments a maximum value The number of successive engagements of the same gear on voluments of the same gear on voluments of the successive engagements of the successive engagement of the successive engagements of the successive engagements of the successive engagement of the suc	lkswagen AG does _f	Ot guarantee or accept		
	in part or in whole, is not be	Detect disengagement of gears on shaft 1 without control Detect disengagement of gears on shaft 2 without control A without control	In spite of a constant desired gear dis- engage- ment counter exceeds a maximum value	• Counter > 3	Battery voltage > 9.0 V for more than 500.0 ms Engine speed > 600 RPM for more than 500.0 ms	Hilly with respect to the correctnes.	
	or commercial purposes,	Detect disengagement of gears on shaft 2 without control	In spite of a constant desired gear dis- engage- ment counter exceeds a maximum value		• Output speed >= 12 RPM	ectness of information in the	
		SULGO JUBUNGO	Profected by	-DA negswe	HOVEOMBINGO Mass		



			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
P2723	Control Solenoid "E" Per- for- mance/ Stuck Off	Open-circuit check O			high-side switches not deactivated by module 2 Change of supply voltage < 1.0 V Duty factor of control gearshift fork valve 1 and 2 <= 10.0% Duty factor of safety valve 1 >= 53% and steady state time >= 50.0	• 300.0 ms	
			.34	.₽4 ~			

			DQ-2	50 6F 02E			
DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
	Pressure Control Solenoid "F" Per- for- mance/ Stuck Off	urposes, in			high-side switches not deactivated by module 2 Change of supply volt- age < 1.0 V Duty factor of control gearshift fork valve 3 and <= 10.0% Duty factor of safety valve 2 >= 53% and steady state time >= 50.0 ms Terminal 15 voltage > 9.0 V for more than 500.0 ms Engine speed > 500 RPM		Sport
U010 0	Lost Commu- nication With ECM/PC M "A"	Time out Check Check To look To	• Failure of all CAN engine messages	• Time-out for more than 490.0 ms	 No bus off error No error failure of all CAN messages Terminal 15 voltage > 9.0 V for more than 500.0 ms > 500.0 ms 	• 490.0 ms	cycles 3



	DQ ₇ 250 6F 02E							
	DTC	Fault Code De- scription	Monitor Strat- egy Descrip- tion	Malfunction Criteria	Threshold Value	Secondary Pa- rameters with Enable Condi- tions	Monitor- ing Time Length	Frequen- cy of checks, MIL Illum
or commercial purposes, in part or in whole, is not being		Fault Code Description		Failure of one or more CAN engine messages (but not all CAN engine messages)	""ormation in this obus	No bus off error No error failure of all CAN messages No error failure of all CAN engine messages Terminal 15 voltage > 9.0 V for more than 500.0 ms > 500.0 ms after reset	• 1,010.0 ms	
	JUKABO Z	l ^Q uAdoo Aq pego	Prote	Failure of all CAN messages but gear- box is still in position to send	• Time-out for more than 2,080.0 ms	 Terminal 15 voltage > 9.0 V for more than 500.0 ms > 500.0 ms after reset 	• 2,080.0 ms	
	U010 3	Lost Commu- nication With Gear Shift Control Module "A"	Time out check	Failure of selector lever CAN messages	• Time-out for more than 490.0 ms	 Kein Bus off Fehler no bus off error No error fail- ure of all CAN mes- sages Terminal 15 voltage > 9.0 V for more than 500.0 ms, > 500.0 ms after re- set 	• 490.0 ms	• 2 driving cycles
	U040 4	Invalid Data Re- ceived From Gear Shift Control Module "A"	Evaluation of selector lever CAN message counter	If the value of message counter is permanent constant or change exceeds a threshold increment an event counter	Maximum change of message counter > 5.0 [-]	 No failure of selector lev- er CAN mes- sages Terminal 15 voltage > 4.0 V for more than 500.0 ms 	• 50.0 ms	• 2 driv- ing cycles

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3.6 Diagnostic Procedures

⇒ "3.6.1 Accelerator Pedal Module GX2," Checking", page <u>203</u>

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- ⇒ "3.6.2 Automatic Glow Time Control Module J179 and Glow Plug, Checking", page 205
- ⇒ "3.6.3 Camshaft Position Sensor G40, Checking", page 209
- ⇒ "3.6.4 CAN-Bus Terminal Resistance, Checking", page
- ⇒ "3.6.5 CAN-Bus Terminal Resistance, Powertrain, Checking", page 214
- ⇒ "3.6.6 Charge Air Pressure Actuator Position Sensor <u>G581 , Checking", page 216</u>
- ⇒ "3.6.7 Differential Pressure Sensor G505, Checking", page 218
- ⇒ "3.6.8 EGR Temperature Sensor G98, Checking", page
- ⇒ "3.6.9 EGR Valve 1 GX5, Checking", page 222

- ⇒ "3.6.12 Engine Coolant Temperature Sensor On Radiator Outlet G83, Checking", page 228
- ⇒ "3.6.13 Engine Speed Sensor G28, Checking", page 230
- "3.6.14 Exhaust Door Control Unit J883, Checking", page
- ⇒ "3.6.15 Exhaust Gas Temperature Sensors, Checking", <u>page 234</u>
- ⇒ "3.6.16 Exhaust Pressure Sensor 1 G450 , Checking", page 236
- ⇒ "3.6.17 Fuel Delivery Unit GX1 / Fuel Pump Relay J17, Checking", page 238
- ⇒ "3.6.18 Fuel Injectors , Checking", page 240
- ⇒ "3.6.19 Fuel Metering Valve N290, Checking", page 242
- ⇒ "3.6.20 Fuel Pressure Regulator Valve N276, Checking", page 244
- ⇒ "3.6.21 Fuel Pressure Sensor G247, Checking", page
- ⇒ "3.6.22 Fuel Pump Relay 2 / Fuel Pump 2, Checking", page 248
- ⇒ "3.6.23 Fuel Temperature Sensor G81, Checking", page
- ⇒ "3.6.24 Intake Flap Control Unit GX14, Checking", page 252
- ⇒ "3.6.25 Intake Manifold Sensor GX9, Checking", page
- ⇒ "3.6.26 Mass Airflow Sensor G70, Checking", page 257
- ⇒ "3.6.27 Outside Air Temperature Sensor G17, Checking", page 259



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- ⇒ "3.6.28 Oxygen Sensor 1 After Catalytic Converter GX7, Checking", page 261
- ⇒ "3.6.29 Oxygen Sensor 1 Before Catalytic Converter GX10, Checking", page 264
- ⇒ "3.6.30 Terminal 30 Power Supply Relay J317 , Checking", page 267
- ⇒ "3.6.31 Three Way Catalytic Converter (TWC), Checking", <u>page 269</u>≌
- ⇒ "3.6.32 ®Throttle Valve Control Module GX3, Checking", page 270 %
- ⇒ "3.6.33 Vehicle Speed Signal, Checking", page 272
- ⇒ "3.6.34 Wastegate Bypass Regulator Valve N75, Checking", page 274

3.6.1 Accelerator Pedal Module - GX2-, Checking

General Description

3 Anniability with respect to the correctness of information in the correc The Accelerator Pedal Position Sensor - G79- and the Accelerator Pedal Position Sensor 2 + G185- are combined in one component and integrated into the Accelerator Pedal Module - GX2- . They are used to detect the position of the accelera tor pedal throughout the entire adjustment range. The Engine Control Module - J623- detects the driver's request from these signals and uses them to calculate the injection quantity and EPC Throttle valve operation.

The Accelerator Pedal Module - GX2- contains the following components:

- Accelerator Pedal Position Sensor G79- .
- Accelerator Pedal Position Sensor 2 G185- .

The Accelerator Pedal Module - GX2- components cannot be serviced separately, and they must be serviced as a unit.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", <u>page 2</u> .
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4

Test P	Generic Scan Tool - Edition 09.2023 Test Procedure				
Step		Procedure		Result / Action to Take	
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified?	- •	YES: GO TO: Step 2 ⇒ page 204 . NO: GATHER more information from customer about the complaint.	
3	• • • • • • • • • • • • • • • • • • • •	IGNITION: OFF. CONNECT: Scan Tool. IGNITION: ON. CHECK: Throttle valve position closed: SPECIFIED VALUE: 3 – 25%. DEPRESS: Accelerator pedal slowly to WOT while observing the percentage display. The percentage display must increase uniformly. CHECK: Throttle valve position at WOT: SPECIFIED VALUE: 84 – 99%. IGNITION: OFF. Was Value obtained? DISCONNECT: Accelerator Pedal Module - GX2- harness connector. IGNITION: ON. CHECK: Accelerator Pedal Module - GX2- harness connector terminals 1 to 5 and 2 to 3 for voltage. SPECIFIED VALUE: About 5.0 V.	+ -+	YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 205. NO: GO TO: Step 3 ⇒ page 204. YES: GO TO: Step 4 ⇒ page 204.	
	• -	IGNITION: OFF. Were Values obtained?			
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Accelerator Pedal Module - GX2-harness connector terminal 4 to the Engine Control Module - J623- harness connector T94 / 53 for resistance. CHECK: Accelerator Pedal Module - GX2-harness connector terminal 6 to the Engine Control Module - J623- harness connector T94 / 54 for resistance. SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$. Were Values obtained?	* * *	YES: REPLACE: Accelerator Pedal Module - GX2 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 205 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 205 .	



Step		Procedure		Result / Action to Take
5		E: Engine Control Module - J623 appropriate repair manual.	-	YES: GO TO: Step 6 <u>⇒ page 205</u> .
	harness Control	: Accelerator Pedal Module - GX2- connector terminal 1 to the Engine Module - J623- harness connector of for resistance.		NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance,
	harness Control	: Accelerator Pedal Module - GX2- connector terminal 2 to the Engine Module - J623- harness connector for resistance.	•	short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
	harness Control	: Accelerator Pedal Module - GX2- connector terminal 3 to the Engine Module - J623- harness connector for resistance.	•	GO TO: Step 6 <u>⇒ page 205</u> .
	harness Control	: Accelerator Pedal Module - GX2- connector terminal 5 to the Engine Module - J623- harness connector for resistance.		
		TED VALUE: 0.5 Ω (± 0.3 Ω).		
		alues obtained?		VEO
6	Final Pro	a road test to verify repair.	(G . V	/YES: CHECK: Engine Control Module - J623- har-
	Pertorm	e original DTC return?		ness connector for any damaged, pushed-out pins.
	- Does till	e original DTC return.	•	REPAIR: As necessary.
		* dunis	♦	If all electrical connections are OK:
			•	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual
		whole, is,	•	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory ", page 24 .
		e original DTC return whole is a not or in whole is	•	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.
		i, so	•	Return vehicle to Customer.
		ware or commercial purposes, in	-	NO: Perform the diagnostic procedure for any DTC's.
		merci	•	If no DTC's return, the repair is complete.
		of com	1	Return vehicle to customer.
		E ALIDA		ILOS.
3.6.2		omatic Glow Time Control Mo	dul	E - DA Nagawagen AG.
J179- and Glow Plug, Checking				
	General Description - DA Negenskie V Korter - DA Negenskie V Korter			
- J623	through the	e activated by the Engine Control Mod e Automatic Glow Time Control Module e on the individual glow plugs is adius	e -	

Automatic Glow Time Control Module -3.6.2 J179- and Glow Plug, Checking

General Description

The glow plugs are activated by the Engine Control Module - J623- through the Automatic Glow Time Control Module -J179- . The voltage on the individual glow plugs is adjusted over the frequency of the PWM impulses. For quick start with an ambient temperature of less than 64° F (18° C), a maximum voltage of 11.5 volts is present during preheating. This ensures that the glow plug heats up as quickly as possible (maximum two seconds) to over 1,832° F (1,000° C), thus reducing the preheating time of the engine. Post-heating is performed up

to a coolant temperature of 64° F (18° C) after engine start for a maximum of five minutes. Post-heating helps reduce hydrocarbon emissions and combustion noise during the engine warm-up phase.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.

- Vehicles with automatic ...
 lever position is in "P".

 Vehicles with manual transmission, ensure the snine.
 position is in "N" with the parking brake applied.

 Observe all safety precautions:

 "1.1 Safety Precautions" wagen AG does not guarantee or address of the same of the same

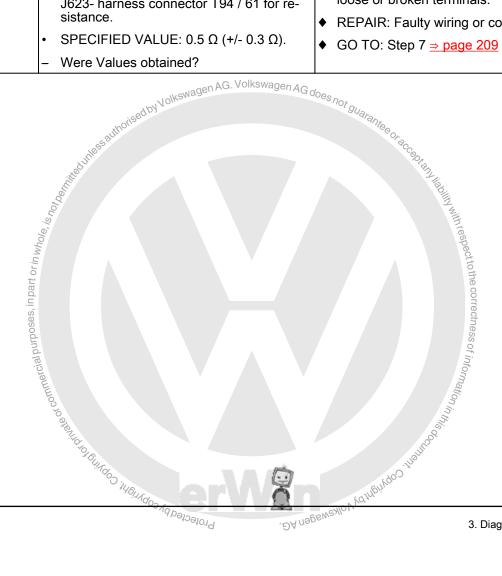


The Glow Plug terminal / connector is not repairable. The harness must be replaced if damaged.

Step	Procedure Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 206 . NO: GATHER more information from customer about the complaint.
2	Check the DTC memory. Refer to ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory ", page 23 . Are there fault codes present for the Glow Plugs?	- YES:
	Protected by copyright, Copyright	-DA negswedlo V V V V V V V V V V V V V V V V V V V



Step	Procedure	Result / Action to Take
3	IGNITION: OFF. DISCONNECT: Automatic Glow Time Control Module - J179- harness connector. IGNITION: ON.	 YES: GO TO: Step 4 ⇒ page 207. NO: PERFORM: Visual Inspection of wiring and component.
	CHECK: Automatic Glow Time Control Module - J179- harness connector termi- nals 6 and 11 to ground for voltage.	◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	CHECK: Automatic Glow Time Control Module - J179- harness connector termi- nal 7 to battery voltage for voltage.	 REPAIR: Faulty wiring or connector. GO TO: Step 7 ⇒ page 209 .
	IGNITION: OFF.	
	SPECIFIED VALUE: Battery voltage.	
	– Were Values obtained?	
4	REMOVE: Engine Control Module - J623 Refer to appropriate repair man- ual.	 YES: REPLACE: Automatic Glow Time Control Module - J179 Refer to appropriate repair manual.
	CHECK: Automatic Glow Time Control Maddal Market	♦ GO TO: Step 7 <u>⇒ page 209</u> .
	Module - J179- harness connector terminal 9 to the Engine Control Module - J623-harness connector T94 / 20 for resistance.	 NO: ◆ PERFORM: Visual Inspection of wiring and component.
	CHECK: Automatic Glow Time Control Module - J179- harness connector termi- nal 10 to the Engine Control Module - J62- harness connector T94 / 61 for re-	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	sistance. • SPECIFIED VALUE: $0.5 \Omega (+/-0.3 \Omega)$.	REPAIR: Faulty wiring or connector.
	- Were Values obtained?	◆ GO TO: Step 7 <u>⇒ page 209</u> .
	- vveie values obtailleu:	



Step	Procedure	Result / Action to Take
5	IGNITION: OFF.	- YES: ▲ CO TO: Step 6 → page 208
	DISCONNECT: Automatic Glow Time Control Module - J179- harness connector.	 ◆ GO TO: Step 6 ⇒ page 208 . – NO: ◆ PERFORM: Visual Inspection of wiring and com-
	REMOVE: Engine Control Module - J623 Refer to appropriate repair man- ual.	 CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion,
	DISCONNECT: Suspect Glow Plug harness connector (per DTC stored).	loose or broken terminals. REPAIR: Faulty wiring or connector.
	CHECK: The suspect Glow Plug (per DTC stored) harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 24 for resistance (refer to appropriate wiring diagram for correct terminal and connector locations).	◆ GO TO: Step 7 ⇒ page 209 .
	CHECK: The suspect Glow Plug (per DTC stored) harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / xx for resistance (refer to appropriate wiring diagram for correct terminal and connector locations).	
	CHECK: The suspect Glow Plug (per DTC stored) harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 36 for resistance (refer to appropriate wiring diagram for correct terminal and connector locations).	
	• SPECIFIED VALUE: 1.3 Ω (+/- 0.3 Ω @ 20° C).	ogen AG. Volkswagen AG.
	Were Values obtained?	_{Nagen} AG. Volkswagen AG does not guare
6	 CHECK: Automatic Glow Time Control Module - J179- harness connector terminal (1, 2, 3, or 4) to suspect Glow Plug harness connector terminal 4 for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). SPECIFIED VALUE 0.5 Ω (+/- 0.3 Ω). 	 YES: TIP: The Glow Plug may fail under loaded operation; please swap a known good Glow Plug prior to continuing to the next step. GO TO: Step 7 ⇒ page 209 . NO: PERFORM: Visual Inspection of wiring and component.
	– Was Value obtained?	♦ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	in ,	 REPAIR: Faulty wiring or connector. GO TO: Step 7 ⇒ page 209 .
	urposk	♦ GO TO: Step 7 ⇒ page 209.
	- Was Value obtained? Nas Value obtained? Rep. Gr.ST - Generic Scan Tool	BA nagewaylo V Valkewayli V Val
208	Rep. Gr.ST - Generic Scan Tool	



7 • Final Procedure • Perform a road test to verify repair. - Does the original DTC return? - YES: • CHECK: Automatic Glow Time 0 - J179- harness connector for all pushed-out pins.					
	ny damaged,				
◆ REPAIR: As necessary.					
◆ If all electrical connections are 0	DK:				
◆ REPLACE: Automatic Glow Timule - J179- Refer to appropriate to appropriate to Clear the DTC's. Refer to Mode 04 – Erase DTC Memory	e repair manual.				
 NO: Perform the diagnostic procedure If no DTC's return, the repair is Return vehicle to customer. Return vehicle to customer. 	eadiness Code. .", page 17 .				
◆ Return vehicle to Customer.	, 8 ¹ / ₁				
- NO: ◆ Perform the diagnostic procedu	e for any DTC's.				
◆ If no DTC's return, the repair is	complete.				
♦ Return vehicle to customer.	ect to th				
n part	le corr				
3.6.3 Camshaft Position Sensor - G40- , Checking	ectness _o				
General Description					
Using the signal from the Camshaft Position Sensor - G40-, the precise position of the camshaft relative to the crankshaft is determined very quickly when the engine is started. Used in combination with the signal from the Engine Speed Sensor G28-, the signal from the Camshaft Position Sensor - G40-allows the Engine Control Module - J623- to detect which cylinder is at TDC. The fuel can be injected into the corresponding cylinder and ignited.	complete.				
Special tools and workshop equipment required	111/2ji,				
pecial tools and workshop equipment required Multimeter.					
Wiring Diagram.					
Scan Tool.					
Juan 1001.					
est requirements					

Camshaft Position Sensor - G40-, 3.6.3 Checking

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", <u>page 2</u> .
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4

Step	Procedure	Result / Action to Take
1 •	PERFORM: Preliminary Check to verify the customers complaint. Refer to <u>⇒ "3.1 Preliminary Check"</u> , page 16. Was Complaint verified?	 YES: GO TO: Step 2 ⇒ page 210 . NO: GATHER more information from customer about the complaint.
2 •	DISCONNECT: Camshaft Position Sensor - G40- harness connector. IGNITION: ON. CHECK: Camshaft Position Sensor - G40- harness connector terminals 1 to 3 for voltage. IGNITION: OFF.	 YES: GO TO: Step 3 ⇒ page 210 . NO: GO TO: Step 4 ⇒ page 210 .
3 •	Refer to appropriate repair manual. CHECK: Camshaft Position Sensor - G40-harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 44 for resistance.	 YES: REPLACE: Camshaft Position Sensor - G40 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 211. NO: PERFORM: Visual Inspection of wiring and component Swagen AG do CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
4 •	REMOVE: Engine Control Module - J623-Refer to appropriate repair manual. CHECK: Camshaft Position Sensor - G40-harness connector terminal 1 to the Engine Control Module - J623-harness connector T60 / 10 for resistance: CHECK: Camshaft Position Sensor - G40-harness connector terminal 3 to the Engine Control Module - J623-harness connector T60 / 51 for resistance.	 YES: GO TO: Step 5 ⇒ page 211. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 211.





	uagen AG. Volkswagen AG.	2 do
Step	Procedure	Result / Action to Take
5	Final Procedure	- YES: Street Control Madula 1602 has
	Perform a road test to verify repair.	 CHECK: Engine Control Module - J623- har- ness connector for any damaged, pushed-out
	– Does the original DTC return?	pins.
		♦ REPAIR: As necessary.
	Tours.	♦ If all electrical connections are OK:
	t orin whole, is not bes,	◆ REPLACE: Engine Control Module - J623 Re fer to appropriate repair manual.
	part orin	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory ", page 24 .
	ri, t	◆ Repair is complete. Generate Readiness Code Refer to <u>⇒ "3.2 Readiness Code", page 17</u> .
	oduno	Return vehicle to Customer.
	of pinuate of commercial purposes	 NO: ◆ Perform the diagnostic procedure for any DTC's.
	D TO	♦ If no DTC's return, the repair is complete.
	A STATE OF THE STA	• Return vehicle to customer.

3.6.4 CAN-Bus Terminal Resistance, Check+QUENTED TO ING. SALUBLE NO. 1971

General Description

The Engine Control Module - J623- communicates with all databus capable control modules via a CAN databus.

These databus capable control modules are connected via two data bus wires which are twisted together (CAN_High and CAN_Low), and exchange information (messages). Missing information on the databus is recognized as a malfunction and may be stored by the Engine Control Module - J623- and the other control modules connected to the CAN-bus.

Trouble-free operation of the CAN-bus requires that it have a terminal resistance. This central terminal resistor is located in the Engine Control Module - J623- .

Special tools and workshop equipment required

- Multimeter.
- ♦ Wiring Diagram.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions",
 page 2.



- Golf, Jetta, Jetta Wagen 2010 > Generic Scan Tool Edition 09.2023

 View clean working conditions:

 "1.2 Clean Working Conditions", page 4

 Test Procedure

 "1-tote

 "1-total and 2010 2014 AJ5 (Jetta SW)

 "1-total and 2010 2014 AJ5 (Jett

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check" page 16. Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 212. NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: As per vehicle being tested, the Data Bus on Board Diagnostic Interface - J533-, or Vehicle Electrical System Control Module - J519-, or Instrument Cluster Control Module - J285- harness connectors. The Engine Control Module - J623- must remain connected for the following step. For the 2010 1K2, 2010 – 2014 AJ5 / 5K1, CHECK: Data Bus on Board Diagnostic Interface - J533- harness connector terminals 6 to 16 for resistance. For the 2011 – 2014 162, CHECK: Vehicle Electrical System Control Module - J519- harness connector terminals 18 to 19 for resistance. For the 5C1 / 5C7, CHECK: Instrument Cluster Control Module - J285- harness connector terminals 29 to 28 for resistance. SPECIFIED VALUE: 60 – 72 Ω (@ approx. 20° C). 	 YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 214. NO: GO TO: Step 3 ⇒ page 213.
	– Was Value obtained?	



AC VOlkewage	Golf, Jetta, Jetta Wagen 2010 ➤
Wolfeswagen AG. Volkswagen AG does	Generic Scan Tool - Edition 09.2023
Step Procedure	Result / Action to Take
• For the 2010 1K2, 2010 – 2014 AJ5 / 5K1, CHECK: Data Bus on Board Diagnostic Interface - J533- harness connector terminal 6 to the Engine Control Module - J623- harness connector T94 / 67 for resistance. • For the 2010 1K2, 2010 – 2014 AJ5 / 5K1, CHECK: Data Bus on Board Diagnostic Interface - J533- harness connector terminal 16 to the Engine Control Module - J623- harness connector T94 / 68 for resistance.	NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.

Step		Procedure	Result / Action to Take
4	•	Perform a road test to verity repair.	 YES: CHECK: As per vehicle being tested, the Data Bus on Board Diagnostic Interface - J533- or Vehicle Electrical System Control Module - J519-, or Instrument Cluster Control Module - J285- harness connectors for any damaged pushed-out pins
			♦ REPAIR: As necessary.
		20	♦ If all electrical connections are OK:
		Does the original DTC return?	◆ REPLACE: As per vehicle being tested, the Data Bus on Board Diagnostic Interface - J533-, or Vehicle Electrical System Control Module - J519-, or Instrument Cluster Control Module - J285 Refer to appropriate repair manual.
		oses, in	◆ Clear the DTC's. Refer to ₹ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory ", page 24.
		vercial purpo	◆ Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.
		Timos	♦ Return vehicle to Customer.
		Lo alentado	 NO: ◆ Perform the diagnostic procedure for any DTC's.
		Olympia Committee Committe	If no DTC's return, the repair is complete. Deturn velocity to the repair is complete.
		*40IM000 C	Return vehicle to customer.
	•	G. Protected by	DA NOUS WORLD.

3.6.5 CAN-Bus Terminal Resistance, Power-train, Checking

General Description

The Engine Control Module - J623- communicates with all databus capable control modules via a CAN databus.

These databus capable control modules are connected via two data bus wires which are twisted together (CAN_High and CAN_Low), and exchange information (messages). Missing information on the databus is recognized as a malfunction and may be stored by the Engine Control Module - J623- and the other control modules connected to the CAN-bus.

Trouble-free operation of the CAN-bus requires that it have a terminal resistance. This central terminal resistor is located in the Engine Control Module - J623- .

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.

- Fuses OK.
- Battery voltage OK.
- · Switch OFF all electrical and electronic accessories.

- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 4

Step		Procedure		Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16.	- ◆	YES: GO TO: Step 2 ⇒ page 215 . NO:
	_	Was Complaint verified? IGNITION: OFF.	age	GATHER more information from customer about the complaint not guar
2	•	IGNITION: OFF. The Engine Control Module - J623- must re-	-	YES: CONDITION: May be intermittent.
		main connected for the following step. The central terminal resistor is located in the Engine Control Module - J623	•	PERFORM: Visual Inspection of wiring and component.
	•	REMOVE: Transmission Control Module . Refer to appropriate repair manual.	*	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	•	CHECK: Transmission Control Module harness connector terminals 15 to 10 for resist-		REPAIR: Faulty wiring or connector.
		ance.	•	GO TO: Step 4 <u>⇒ page 216</u> .
	•	SPECIFIED VALUE: 60 – 72 Ω (@ approx. 20° C).	→	REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 216. NO: GO TO: Step 3 ⇒ page 215.
	_	Was Value obtained?		less
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate epair manual.		YES: REPLACE: Engine Control Module - J623- Refer to appropriate repair manual.
	•	CHECK: CAN bus circuit between the Transmission Control Module harness connector		GO TO: Step 4 <u>⇒ page 216</u> .
		terminal 15 and the Engine Control Module - J623- harness connector T94 / 67 for resist-	- •	NO: PERFORM: Visual Inspection of wiring and
		ance.		component.
	•	CHECK: CAN bus circuit between the Transmission Control Module harness connector terminal 10 and the Engine Control Module - J623- harness connector T94 / 68 for resist-		CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		ance.	le ∳ 0,	REPAIR: Faulty Willing or connector.
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	•	GO TO: Step 4 ⇒ page 216 .
	_	Were Values obtained?		

		\$5 ³	**C.
Step		Procedure Auri	Result / Action to Take
4	•	Final Procedure Perform a road test to verify repair. Does the original DTC return?	 YES: ◆ CHECK: Transmission Control Module harness connector for any damaged, pushed out pins.
		Who	♦ REPAIR: As necessary.
		torin	♦ If all electrical connections are OK:
		s, in part	REPLACE: Transmission Control Module . Refer to appropriate repair manual.
		esodunc	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.
		ommercial	◆ Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17
		560	♦ Return vehicle to Customer.
		Copyright: Copyright of Commercial purposes, in p.	 NO: ◆ Perform the diagnostic procedure for any DTC's.
		1461.	♦ If no DTC's return, the repair is complete.
		ed by copy.	Return vehicle to customer.

3.6.6 Charge Air Pressure Actuator Position Sensor - G581-, Checking

General Description

The Charge Air Pressure Actuator Position Sensor - G581- delivers the position of the guide vanes of the turbocharger to the Engine Control Module - J623- . Together with the Charge Air Pressure Sensor - G31- , this allows conclusions about the state of boost pressure control.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified? 	Result / Action to Take - YES: New agen AG. Volkswagen AG does not gual ante of the South Step 2 ⇒ page 217. NO: GATHER more information from customer about the complaint.
3	 IGNITION: OFF. DISCONNECT: Charge Air Pressure Actuator Position Sensor - G581- harness connector. IGNITION: ON. CHECK: Charge Air Pressure Actuator Position Sensor - G581- harness connector terminals 1 to 3 for voltage. SPECIFIED VALUE: About 5.0 V. IGNITION: OFF. Was Value obtained? REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. CHECK: Charge Air Pressure Actuator Position Sensor - G581- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 58 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 217 . NO: GO TO: Step 4 ⇒ page 217 . YES: REPLACE: Charge Air Pressure Actuator Position Sensor - G581 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 218 .
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Charge Air Pressure Actuator Position Sensor - G581- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 53 for resistance. CHECK: Charge Air Pressure Actuator Position Sensor - G581- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 25 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 REPAIR. Faulty willing of connector. GO TO: Step 5 ⇒ page 218. YES: GO TO: Step 5 ⇒ page 218. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 218.

Step	Procedure	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory ", page 24 . Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17 . Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

3.6.7 Differential Pressure Sensor - G505-, Checking

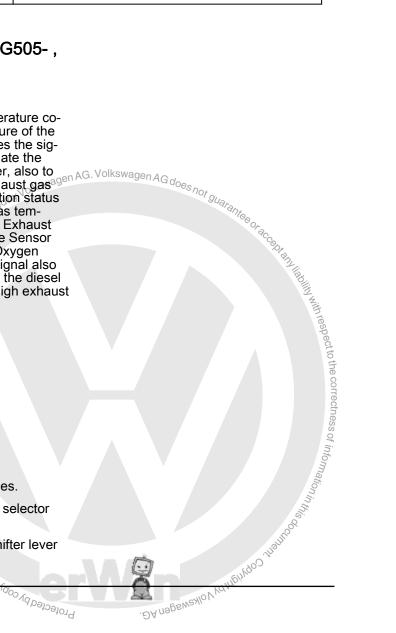
General Description

Exhaust gas temperature sensors are positive temperature coefficient (PTC) sensors. They measure the temperature of the exhaust gas. The Engine Control Module - J623- uses the signals from exhaust gas temperature sensors to calculate the amount of contamination in the diesel particulate filter, also to protect the turbocharger from unacceptably high exhaust gas temperatures. The diesel particulate filter contamination status is calculated using these signals from the exhaust gas temperature sensors, together with the signals from, the Exhaust Pressure Sensor 1 - G450-, the Differential Pressure Sensor - G505-, the Mass Airflow Sensor - G70-, and the Oxygen Sensor 1 Before Catalytic Converter - GX10-. The signal also serves as a component protection in order to protect the diesel particulate filter and turbocharger from excessively high exhaust gas temperatures.

Special tools and workshop equipment required

- Multimeter.
- ♦ Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.



- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- Observe all salety processing page 2.

 View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.

Step		Procedure	Result / Action to Take
n part or in whole, is	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16.	 YES: GO TO: Step 2 ⇒ page 219 . NO:
npart or j	-	Was Complaint verified?	GATHER more information from customer about the complaint.
, ses	•	IGNITION: OFF.	- YES:
sodund Ir	•	DISCONNECT: Differential Pressure Sensor - G505- harness connector.	◆ GO TO: Step 3 page 219 . - NO:
lercia	•	IGNITION: ON.	◆ GO TO: Step 4 page 219 .
2 201 commercial purposes, in	·	CHECK: Differential Pressure Sensor - G505- harness connector terminals 1 to 2 for voltage.	TONE THE PIECE OF
	.0	IGNITION: OFF.	ingg
	•	SPECIFIED VALUE: About 5.0 V	iga
	_	Was Value obtained?	augindo c
3	•	REMOVE: Engine Control Module 1623 Refer to appropriate repair manual and property of the Refer to appropriate repair manual and property of the Reference of t	◆ REPLACE: Differential Pressure Sensor -
	•	For 2010 – 2014 5K1 (Golf) only, CHECK: Differential Pressure Sensor - G505- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 11 for resistance.	 G505 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 220 . NO: PERFORM: Visual Inspection of wiring and component.
	•	For all others, CHECK: Differential Pressure Sensor - G505- harness connector terminal 3 to the Engine Control Module - J623- har- ness connector T94 / 34 for resistance.	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	•	SPECIFIED VALUE: $0.5~\Omega$ (± $0.3~\Omega$).	◆ REPAIR: Faulty wiring or connector.
	_	Was Value obtained?	◆ GO TO: Step 5 ⇒ page 220 .
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	 YES: GO TO: Step 5 ⇒ page 220 .
	•	CHECK: Differential Pressure Sensor - G505- harness connector terminal 1 to the Engine Control Module - J623- harness con- nector T94 / 14 for resistance.	 NO: PERFORM: Visual Inspection of wiring and component.
	•	CHECK: Differential Pressure Sensor - G505- harness connector terminal 2 to the Engine Control Module - J623- harness con-	♦ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		nector T94 / 79 for resistance.	◆ REPAIR: Faulty wiring or connector.
	•	SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	◆ GO TO: Step 5 ⇒ page 220 .
	_	Were Values obtained?	

Step	Procedure	Result / Action to Take	
5	Final ProcedurePerform a road test to verify repair.	YES: agen AG. Volkswagen AG agen AG. Volkswagen AG. Volks	
	- Does the original DTC return?	pins.	
	lines	REPAIR: As necessary.	
		♦ If all electrical connections are OK:	
	not post	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.	
	whole, is	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory ", page 24.	
	ate of commercial purposes, in part or in whole, is not be while	 REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory ", page 24 . Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17 . Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer. 	
		♦ Return vehicle to Customer.	
	roial purpo:	 NO: ◆ Perform the diagnostic procedure for any DTC's. 	
	MIMING	♦ If no DTC's return, the repair is complete.	
	03 to 948		
THE TOTAL STATE OF THE PARTY OF			
3.6.8	EGR Temperature Sensor - G98 Checking	dae DA nagewaylo V V V V V V V V V V V V V V V V V V V	
Genera	al Description	. DAnagewayer	
	GR Temperature Sensor - G98- supplies exhaust lation system temperature data to the Engine Co	gas ntrol	

EGR Temperature Sensor - G98-, 3.6.8 Protected by copyrigh Checking

General Description

The EGR Temperature Sensor - G98- supplies exhaust gas recirculation system temperature data to the Engine Control Module - J623-, which is used as an input in deciding on the correct EGR valve setting.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4





Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified? 	- YES: ◆ GO TO: Step 2 ⇒ page 221 . olkswagen AG does not information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: EGR Temperature Sensor - G98- harness connector. CHECK: EGR Temperature Sensor - G98- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 215 Ω (+/- 50 Ω @ approx. 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 221 NO: REPLACE: EGR Temperature Sensor - G98 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 221 .
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: EGR Temperature Sensor - G98-harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 54 for resistance. CHECK: EGR Temperature Sensor - G98-harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 55 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: TIP: The EGR Temperature Sensor - G98-may fail under loaded operation; please swap a known good EGR Temperature Sensor - G98- prior to continuing to the next step. GO TO: Step 4 ⇒ page 221 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 221 . YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
		 REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory ", page 24. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

3.6.9 EGR Valve 1 - GX5 - , Checking

General Description

The EGR Vacuum Regulator Solenoid Valve - N18- is a positioning motor used to actuate the exhaust gas recirculation valve. The exhaust gas recirculation rate is determined by means of a performance map in the Engine Control Module - J623- . The EGR Vacuum Regulator Solenoid Valve - N18- receives a pulse-width modulated signal from the Engine Control Module - J623- to control the flow of exhaust gas into the intake manifold. The EGR Potentiometer - G212- monitors the position of the EGR Valve 1 - GX5- and reports the EGR Valve 1 - GX5position to the Engine Control Module - J623-.

The EGR Valve 1 - GX5- contains the following components:

- EGR Vacuum Regulator Solenoid Valve N18- .
- EGR Potentiometer G212- .

The EGR Valve 1 - GX5- components cannot be serviced separately, and they must be serviced as a unit.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied."
- Observe all safety precautions: ⇒ "1.1 Safety Precautions"
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4

Test Procedure

Step	Procedure	Result / Action to Take
1	• %PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16 . Was Complaint verified?	 YES: GO TO: Step 2 ⇒ page 223 . NO: GATHER more information from customer about the complaint.
	Mago Vanina Bourd of Maria Port Continues of	thess of information in the state of the sta
222	Rep. Gr.ST - Generic Scan Toobajoja	NOKEWS,



Step		Procedure		Result / Action to Take
2	•	IGNITION: OFF.	<u> </u>	YES:
	•	DISCONNECT: EGR Valve 1 - GX5 - harness connector.	-	GO TO: Step 3 <u>⇒ page 223</u> . NO:
	•	IGNITION: ON.	•	GO TO: Step 4 ⇒ page 223 .
	•	CHECK: EGR Valve 1 - GX5 - harness connector terminals 1 to 3 for voltage.		
	•	IGNITION: OFF.		
	•	SPECIFIED VALUE: About 5.0 V.		
	_	Was Value obtained?		
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: REPLACE: EGR Valve 1 - GX5 Refer to appropriate repair manual.
	•	CHECK: EGR Valve 1 - GX5 - harness connector terminal 2 to the Engine Control Mod-	•	GO TO: Step 5 ⇒ page 224 .
		ule - J623- harness connector T60 / 4 for re-	Ľ	NO:
		sistance. CHECK: EGR Valve 1 - GX5 - harness con-	•	PERFORM: Visual Inspection of wiring and component.
		nector terminal 5 to the Engine Control Module - J623- harness connector T60 / 57 for resistance.		CHECK: Wiring for open, high resistance, short on harness connector for damage, cor- rosion, loose or broken terminals.
	•	CHECK: EGR Valve 1 - GX5 - harness con-	1	REPAIR: Faulty wiring or connector.
		nector terminal 6 to the Engine Control Mod- ule - J623- harness connector T60 19 for resistance.		00 TO 01 5
	•	SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).		Or BIZE
	_	Were Values obtained?		GO TO: Step 5 ⇒ page 224.
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	•	YES: GO TO: Step 5 ⇒ page 224 . NO:
	•	CHECK: EGR Valve 1 - GX5 - harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 25 for resistance.	→	NO: PERFORM: Visual Inspection of wiring and component.
	•	CHECK: EGR Valve 1 - GX5 - harness connector terminal 3 to the Engine Control Mod-	*	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		ule - J623- harness connector T60 / 53 for resistance.	•	REPAIR: Faulty wiring or connector.
		SPECIFIED VALUE: 0.5Ω (± 0.3 Ω).	•	GO TO: Step 5 <u>⇒ page 224</u> .
	_	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		rosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 224.
		Were Values obtained? 6	100	DA nagewaylo V Vol Mayingo O Trantoo Silvano O

Step	Procedure	Result / Action to Take
5	Final ProcedurePerform a road test to verify repair.	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out
	Does the original DTC return?	pins. ◆ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory ", page 24.
		Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.
		Return vehicle to Customer.
	aduntese authorised by Volkswagen AG. Volkswag	− NO: Perform the diagnostic procedure for any DTC's ought
	authoris	◆ If no DTC's return, the repair is complete.
	diffess	Return vehicle to customer.

EGR Valve 2 - GX6-, Checking 3.6.10

General Description

DA nageweato the concerness of information in the state of the concerness of the state of the concerness of the concerness of information in the state of the concerness of the co The Valve 2 For EGR - N213- is a positioning motor used to actuate the exhaust gas recirculation valve. The exhaust gas recirculation rate is determined by means of a performance map in the Engine Control Module - J623- . The Valve 2 For EGR -N213- receives a pulse-width modulated signal from the Engine Control Module - J623- to control the flow of exhaust gas into the intake manifold.

The EGR Valve 2 - GX6- contains the following components:

- Valve 2 For EGR N213- .
- Exhaust Gas Recirculation Position Sensor 2 G466-.

The EGR Valve 2 - GX6- components cannot be serviced separately, and they must be serviced as a unit.

Special tools and workshop equipment required Protected by copyright

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.



- Observe all safety precautions: ⇒ "1.1 Safety Precautions" Volkswagen AG does not guarantee of acceptable of acce

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 225 . NO: GATHER more information from customer about the complaint.
2	IGNITION: OFF.: 'g	- YES: ◆ GO TO: Step 3 ⇒ page 225 .
	DISCONNECT: EGR Valve 2 - GX6- harness connector.	- NO: ◆ GO TO: Step 4 ⇒ page 225 .
	IGNITION: ON. GECK: EGR Valve 2 - GX6- harness connector terminals 1 to 3 for voltage.	- YES: ◆ GO TO: Step 3 ⇒ page 225 . - NO: ◆ GO TO: Step 4 ⇒ page 225 . - YES:
	SPECIFIED VALUE: About 5.0 V.	n th
	• IGNITION: OFF.	Inost
	- Was Value obtained?	· ing
3	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	♦ REPLACE EGR Valve 2 - GX6- Refer to
	CHECK: EGR Valve 2 - GX6- harness control Module - J623- harness connector T60 / 34 for resistance.	- NO:
	CHECK: EGR Valve 2 - GX6- harness connector terminal 5 to the Engine Control Module - J623- harness connector T60 / 41 for resistance.	 PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	CHECK: EGR Valve 2 - GX6- harness con- nector terminal 6 to the Engine Control Mod- ule - J623- harness connector T60 / 49 for resistance.	 REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 226 .
	• SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	
	Were Values obtained?	
4	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	 YES: GO TO: Step 5 ⇒ page 226 .
	CHECK: EGR Valve 2 - GX6- harness con- nector terminal 1 to the Engine Control Mod- ule - J623- harness connector T60 / 25 for resistance.	 NO: ◆ PERFORM: Visual Inspection of wiring and component.
	CHECK: EGR Valve 2 - GX6- harness con- nector terminal 3 to the Engine Control Mod- ule - J623- harness connector T60 / 53 for	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	resistance.	♦ REPAIR: Faulty wiring or connector.
	• SPECIFIED VALUE: 0.5Ω (± 0.3Ω).	◆ GO TO: Step 5 <u>⇒ page 226</u> .
	Were Values obtained?	

	Procedure	Result / Action to Take
5	Final Procedure	YES:◆ CHECK: Engine Control Module - J623- har-
	 Perform a road test to verify repair. 	ness connector for any damaged, pushed-oupins.
	Does the original DTC return?	REPAIR: As necessary.
		◆ If all electrical connections are OK:
		REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		 Clear the DTC's. Refer to ⇒ "3.3.4 Diagnosti Mode 04 – Erase DTC Memory", page 24.
		Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.
		Return vehicle to Customer.
	1 Engine Coolant Temperature Sen G62-, Checking al Description Ingine Coolant Temperature Sensor - G62- sends in sout the current coolant temperature to the Engine e - J623 It uses the coolant temperature as a corror calculating the injection quantity. al tools and workshop equipment required Itimeter. Ing Diagram. In Tool. Equirements Ses OK. Intery voltage OK. Interior voltage OK. Interior in "P". Inteles with automatic transmission, ensure the selector position is in "P". Inteles with manual transmission, ensure the shifter sition is in "N" with the parking brake applied. Serve all safety precautions: ⇒ "1.1 Safety Precauting 2. We clean working conditions: ⇒ "1.2 Clean Working is", page 4. Rep. Gr.ST - Generic Scan Tool	 NO: ◆ Perform the diagnostic procedure for any DTC's
		♦ If no DTC's return, the repair is complete.
		Return vehicle to customer.
/iodule /alue f	e - Jo∠3 It uses the coolant temperature as a cor for calculating the injection quantity.	rection Ses not gualantee
>pecia ► Mul	Itimeter	O Reception
▶ Wir	ing Diagram.	Tegg.
Scan	an Tool.	
Γest re	equirements	With to
Fus	ses OK.)spec
Bat	tery voltage ÖK.	to the
Swi	itch OFF all electrical and electronic accessories.	COTT
Veh leve	nicles with automatic transmission, ensure the sele er position is இ "P".	ector
Ver pos	nicles with manual transmission, ensure the shifter sition is in "N" with the parking brake applied.	lever of inform
Obs	serve all safety precautions: <u>⇒ "1.1 Safety Precaut</u> <u>ge 2</u> .	ions".
209	w clean working conditions: - "1.2 Clean Working	Condi-
Viev tion	is", page 4	ikalingok





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Test	t Proc	cedure Santes Or Re	9C
Ste	p	Procedure	Result / Action to Take
whole, is not be with	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16 . Was Complaint verified?	 YES: GO TO: Step 2 ⇒ page 227 . NO: GATHER more information from customer about the complaint.
1 2 3 Commercial purposes, in part or in whole, is not before the second		IGNITION: OFF. DISCONNECT: Engine Coolant Temperature Sensor - G62- harness connector. CHECK: Engine Coolant Temperature Sensor - G62- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 2,250 Ω (+/- 750 Ω @ approx. 20° C). Was Value obtained? REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. For 2010 – 2014 5K1 (Golf), CHECK: Engine Coolant Temperature Sensor - G62- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 54 for resistance. For 2010 – 2014 5K1 (Golf), CHECK: Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 43 for resistance. For all others, CHECK: Engine Coolant Temperature Sensor - G62- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 43 for resistance. For all others, CHECK: Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector terminal 2 to the Engine Coolant Temperature Sensor - G62- harness connector T60 / 54 for resistance.	 NO: REPLACE: Engine Coolant Temperature Sensor-G62 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 228. TIP: The Engine Coolant Temperature Sensor - G62- may fail under loaded operation; please swap a known good Engine Coolant Temperature Sensor - G62- prior to continuing to the next step. GO TO: Step 4 ⇒ page 228. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 228.
	•	SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	
		Were Values obtained?	

Step	Procedure	Result / Action to Take
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		♦ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.
		Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.
		♦ Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		♦ If no DTC's return, the repair is complete.
		Return vehicle to customer.

3.6.12 **Engine Coolant Temperature Sensor** On Radiator Outlet - G83-, Checking

General Description

General Description
The Engine Coolant Temperature Sensor On Radiator Outlet -G83- sends information about the current coolant temperature to the Engine Control Module - J623- . It uses the coolant temperature as a correction value for calculating the injection quantity.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- . DA nagswaylo V Vo Hony



Step		Procedure	Result / Action to Take	
1	-	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified?	 YES: GO TO: Step 2 ⇒ page 229 . NO: GATHER more information from customer about the complaint. 	
3	•	IGNITION: OFF. DISCONNECT: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector. CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 2,250 Ω (+/- 750 Ω @ approx. 20° C). Was Value obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Engine Coolant Temperature Sen-	sor On Radiator Outlet - G83- may fall under	
	•	sor On Radiator Outlet - G83- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 16 for resistance. CHECK: Engine Coolant Temperature Sensor On Radiator Outlet - G83- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 89 for resistance. SPECIFIED VALUE: 0.5Ω ($\pm 0.3 \Omega$). Were Values obtained?	loaded operation; please swap a known good Engine Coolant Temperature Sensor On Radiator Outlet - G83- prior to continuing to the next step. ◆ GO TO: Step 4 ⇒ page 230. NO: ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 4 ⇒ page 230.	with respect to the correctness of information
		io de la	Protected by Volkswagen AG. Protected by Volkswagen AG.	ation in the

Step	Procedure	Result / Action to Take				
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. 				
		♦ REPAIR: As necessary.				
		♦ If all electrical connections are OK:				
		♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.				
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.				
	an Ar Volkswagen	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.				
	s author.	♦ Return vehicle to Customer.				
	Eijik drijes	 NO: ◆ Perform the diagnostic procedure for any DTC's. 				
	0 2/0	♦ If no DTC's return, the repair is complete.				
	6,87	♦ Return vehicle to customer.				
Gener The Ei marks	A Return vehicle to customer. 3.6.13 Engine Speed Sensor - G28- , Checking General Description The Engine Speed Sensor - G28- detects rpm and reference marks from a toothed wheel on the crankshaft. Without an engine speed signal, the engine will not start. If the engine speed signal fails while the engine is running, the engine will stop immediately. Special tools and workshop equipment required Multimeter. Wiring Diagram. Scan Tool. Test requirements Fuses OK. Battery voltage OK.					
	peed signal, the engine will not start. If the engine fails while the engine is running, the engine will stately.	speed Sation of the state of th				
Specia	al tools and workshop equipment required	, some state of the state of th				
♦ Mu	ltimeter.	, italia				
♦ Wir	ring Diagram.	J. Bukdo'S				
♦ Sca	 Multimeter. Wiring Diagram. Scan Tool. Test requirements Tuesco OK					
Test re	Test requirements					
• Fus	ses OK.					
• Bat	ttery voltage OK.					
• Sw	Switch OFF all electrical and electronic accessories.					
	hicles with automatic transmission, ensure the sele er position is in "P".	ector				

Engine Speed Sensor - G28-, Check-3.6.13 ing

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.



Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers concern. Refer to ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 231 . NO: GATHER more information from customer about the complaint.
3	 IGNITION: OFF. CONNECT: Scan Tool. START or CRANK: Engine. CHECK: Engine rpm. SPECIFIED VALUE: Cranking or Idle rpm. IGNITION: OFF. Was Value obtained? DISCONNECT: Engine Speed Sensor - G28-harness connector. IGNITION: ON. 	 ◆ CONDITION: May be intermittent. ◆ PERFORM: Visual Inspection of wiring and component. ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 6 ⇒ page 232. NO: ◆ GO TO: Step 3 ⇒ page 231. YES: ◆ GO TO: Step 4 ⇒ page 231.
	 CHECK: Engine Speed Sensor - G28- harness connector terminals 1 to 3 for voltage. SPECIFIED VALUE: About 5.0 V. IGNITION: OFF. Was Value obtained? 	◆ GO TO: Step 5 ⇒ page 232.
4	 REMOVE: Engine Control Module - J623-Refer to appropriate repair manual. CHECK: Engine Speed Sensor - G28- harmess connector terminal 2 to the Engine Control Module - J623- harness connector T60 p 52 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: REMOVE: Engine Speed Sensor - G28 Refer to appropriate repair manual. CHECK: Engine Speed Sensor - G28- sensor wheel for proper seating, damage and/or run - out. Refer to appropriate repair manual. Sensor wheel OK. REPLACE: Engine Speed Sensor - G28 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 232 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 232 .

		Procedure		Result / Action to Take	
5	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: GO TO: Step 6 <u>⇒ page 232</u> .	
	•	CHECK: Engine Speed Sensor - G28- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 25 for resistance.	•	NO: PERFORM: Visual Inspection of wiring and component.	
	•	CHECK: Engine Speed Sensor - G28- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 53 for resistance.	* *	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.	
		SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	•	GO TO: Step 6 ⇒ page 232.	
	_	Were Values obtained?			
6	•	Final Procedure Perform a road test to verify repair. Does the original DTC return?	-	YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.	
	-	Does the original DTC returns	•	REPAIR: As necessary.	
			•	If all electrical connections are OK:	
			•	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.	
			•	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 at Erase DTC Memory ", page 24 .	
		in whole is not the state of th	db	Repair is complete. Generate Readiness Code. Refer to <u>⇒ "3.2 Readiness Code"</u> , page 17.	
		adunlassac	*	Return vehicle to Customer.	
			•	NO: Perform the diagnostic procedure for any DTC's.	
, s,		•	If no DTC's return, the repair is complete.		
		in who J	*	Return vehicle to customer.	
3.6.14 Exhaust Door Control Unit - J883- , Checking General Description This procedure can be used to diagnose the Exhaust Door Control Unit - J883- , which is controlled with dedicated circuitry					
between it and the Engine Control Module 5 J623					
אואסריי	Special tools and workshop equipment required ♦ Multimeter.				
-	ıltim	Wiring Diagram.			
• Mι		g Diagram.		(%)	
• Mι • Wi	ring	g Diagram. Tool.	1/100	May	
MιWiSc	ring an	g Diagram. Tool. lirements	1/100	Johnstord Start Photography Contracted by Contracted by Contracting the Contracting of th	
♦ Mu ♦ Wi ♦ Sc Test r	ring an eq u	Tool.	Modos	Did Deloched Protected by Confected by Confe	
♦ Mu ♦ Wi ♦ Sc Test r	ring an eq u ses	g Diagram. Tool. iirements s OK. ry voltage OK.	1/100:	DANagen AG. Protected by Colected by Colec	

Exhaust Door Control Unit - J883-, 3.6.14 Checking

General Description

Special tools and workshop equipment required Protected by copyright, Copyrigh

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.



- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.

1 • PERFORM: Preliminary Check to verify the	_
customers complaint. Řefer to <u>⇒ "3.1 Preliminary Check", page 16</u> . - Was complaint verified? • IGNITION: OFF. • GO TO: Step 2 <u>⇒ page 233</u> . - NO: • GATHER more information from custome about the complaint. - YES:	er
 DISCONNECT: Exhaust Door Control Unit J883- harness connector. REMOVE: Engine Control Module J623- Refer to appropriate repair manual. CHECK: Exhaust Door Control Unit J883- harness connector terminal 1 to the Engine Control Module J623- harness connector T94 / 14 for resistance. CHECK: Exhaust Door Control Unit J883- harness connector terminal 2 to the Engine Control Module J623- harness connector T94 / 76 for resistance. CHECK: Exhaust Door Control Unit J883- harness connector terminal 3 to the Engine Control Module J623- harness connector T94 / 79 for resistance. CHECK: Exhaust Door Control Unit J883- harness connector terminal 4 to the Engine Control Module J623- harness connector T94 / 7 for resistance. CHECK: Exhaust Door Control Unit J883- harness connector terminal 4 to the Engine Control Module J623- harness connector T94 / 7 for resistance. CHECK: Exhaust Door Control Unit J883- harness connector terminal 5 to the Engine Control Module J623- harness connector T94 / 29 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). — Were Values obtained? 	ınd e,

Step	Procedure	Result / Action to Take
3	Final ProcedurePerform a road test to verify repair.	→ YES: ◆ CHECK: Engine Control Module - J623- har-
	Does the original DTC return?	ness connector for any damaged, pushed-out pins.
	Ğ	♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	eedby Volkswagen A.G. Volks	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04" Erase DTC Memory ", page 24
	dundesauthoni	◆ Repair is complete. Generate Readiness Code. Refer to ⇒ "3'2 Readiness Code", page 17
		♦ Return vehicle to Customer.
	ole, is not be	ness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 Erase DTC Memory", page 24. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.
	n whi	♦ If no DTC's return, the repair is complete.
	art ori	♦ Return vehicle to customer.

are positive temperature comeasure the temperature of the gine Control Module - J623- uses the signore contamination in the diesel particulate filter. They almost the turbocharger from unacceptably high exhaust gas temperatures. The diesel particulate filter contamination status is calculated using these signals from the exhaust gas temperature sensors, together with the signals from; the Exhaust Pressure Sensor 1 - G450-, the Differential Pressure Sensor Pressure Sensor 1 - G450-, and the Oxygen Sensor 1 - Before Catalytic Converter - GX10-. The signal from the exhaust gas temperature sensors also serves as component to protect the diesel particulate filter urbocharger from excessively high exhaust of the Exhaust Gas Temperature Sensor Exhaust Gas Temperature Sens

- Exhaust Gas Temperature Sensor 3 G495- .
- Exhaust Gas Temperature Sensor 4 G648- .

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.

 est Procedure

 **T.2 Clean Working Conditions Conditions

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 235 . NO: GATHER more Information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Suspect Exhaust Gas Temperature Sensor harness connector. CHECK: Suspect Exhaust Gas Temperature Sensor component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 220 Ω (+/- 50 Ω @ approx 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 235. NO: REPLACE: Exhaust Gas Temperature Sensor . Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 236.
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Suspect Exhaust Gas Temperature Sensor harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 89 for resistance. CHECK: Suspect Exhaust Gas Temperature Sensor harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / xx for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: TIP: The Exhaust Gas Temperature Sensor may fail under loaded operation; please swap a known good Exhaust Gas Temperature Sensor prior to continuing to the next step. GO TO: Step 4 ⇒ page 236 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 236 .

Step	Procedure	Result / Action to Take
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		♦ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.
		Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.
		♦ Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		♦ If no DTC's return, the repair is complete.
		Return vehicle to customer.

Exhaust Pressure Sensor 1 - G450-, 3.6.16 Checking

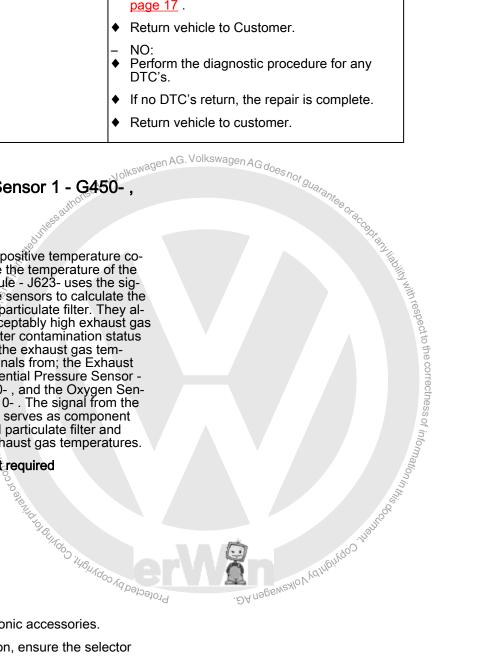
General Description

Exhaust gas temperature sensors are positive temperature coefficient (PTC) sensors. They measure the temperature of the exhaust gas. The Engine Control Module - J623- uses the signals from the exhaust gas temperature sensors to calculate the amount of contamination in the diese particulate filter. They also protect the turbocharger from unacceptably high exhaust gas temperatures. The diesel particulate lilter contamination status is calculated using these signals from the exhaust gas temperature sensors, together with the signals from; the Exhaust Pressure Sensor 1 - G450-, the Differential Pressure Sensor -G505-, the Mass Airflow Sensor - G70-, and the Oxygen Sensor 1 Before Catalytic Converter - GX10- . The signal from the exhaust gas temperature sensors also serves as component protection in order to protect the diesel particulate filter and turbocharger from excessively high exhaust gas temperatures.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".





- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.

 View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.

Step		Procedure		Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16.	- ◆	YES: GO TO: Step 2 ⇒ page 237 . NO:
	_	Was Complaint verified?	•	GATHER more information from customer about the complaint.
2	•	IGNITION: OFF. tg	-	YES:
	•	DISCONNECT: Exhaust Pressure Sensor 1 - G450- harness connector.	_	GO TO: Step 3 ⇒ page 237 . NO: CO TO: Step 4 → page 237
	•	IGNITION: ON.		GO TO: Step 4 <u>⇒ page 237</u> .
	•	CHECK: Exhaust Pressure Sensor 1 - G450-harness connector terminals 1 to 2 for voltage.		YES: GO TO: Step 3 ⇒ page 237. NO: GO TO: Step 4 ⇒ page 237. YES: YE
	•	SPECIFIED VALUE: About 5.0 V.	L	In this
	•	IGNITION: OFF.		li de la companya de
	_	Was Value obtained?		ilian.
3	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: REPLACE Exhaust Pressure Sensor 1 - G450 Refer to appropriate repair manual.
	•	For 2010 – 2014 5K1 (Golf), CHECK: Expansion 1 - G450- harness connector terminal 3 to the Engine Control	./♦	GO TO: Step 5 ⇒ page 238.
		Module - J623- harness connector T94 / 34 for resistance.	-	NO: PERFORM: Visual Inspection of wiring and component.
	•	For all others, CHECK: Exhaust Pressure Sensor 1 - G450- harness connector terminal 3 to the Engine Control Module - J623- har- ness connector T94 / 11 for resistance.	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	•	SPECIFIED VALUE: $0.5~\Omega~(\pm~0.3~\Omega)$.	•	REPAIR: Faulty wiring or connector.
	-	Was Value obtained?	•	GO TO: Step 5 ⇒ page 238 .
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	-	YES: GO TO: Step 5 ⇒ page 238 .
	•	CHECK: Exhaust Pressure Sensor 1 - G450-harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 14 for resistance.		NO: PERFORM: Visual Inspection of wiring and component.
	•	CHECK: Exhaust Pressure Sensor 1 - G450-harness connector terminal 2 to the Engine	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		Control Module - J623- harness connector T94 / 79 for resistance.	•	REPAIR: Faulty wiring or connector.
	•	SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	•	GO TO: Step 5 <u>⇒ page 238</u> .
	_	Were Values obtained?		

Step	Procedure	Result / Action to Take			
5	Final Procedure Perform a road test to verify repair. Procedure 2. Procedure 2.	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. 			
	– Does the original DTC return?	◆ REPAIR: As necessary.			
		♦ If all electrical connections are OK:			
		REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.			
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24			
		Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.			
		Return vehicle to Customer.			
		 NO: ◆ Perform the diagnostic procedure for any DTC's. 			
		♦ If no DTC's return, the repair is complete.			
	uthorised by Volkewagen AG. Volkswagen AG.	Return vehicle to customer.			
	edph Notkewage.	adoes not guerr			
3.6.1	Fuel Delivery Unit - GX1- / Fuel P Relay - J17- , Checking	ump Recording to the second se			
Gene	ral Description	la l			
3.6.17 Fuel Delivery Unit - GX1- / Fuel Pump Relay - J17- , Checking General Description The Fuel Pump Relay - J17- is cycled on and off by the Engine/Motor Control Module - J623- , thereby providing power to the Transfer Fuel Pump - G6- , which is contained within the Fuel Delivery Unit - GX1- contains the following components: ↑ Transfer Fuel Pump - G6 ↑ Fuel Level Sensor - G The Fuel Delivery Unit - GX1- components cannot be serviced separately, and they must be serviced as a unit. Special tools and workshop equipment required ↑ Multimeter. ↑ Wiring Diagram. ↑ Scan Tool. Test requirements Fuses OK. Battery voltage OK. Switch OFF all electrical and electronic accessories. Mobiles with extraordic transprinting accessories.					
The F	uel Delivery Unit - GX1- contains the following com	npo-			
♦ Tra	ansfer Fuel Pump - G6	orrec			
♦ Fu	el Level Sensor - G	iness			
The F	uel Delivery Unit - GX1- components cannot be se ately, and they must be serviced as a unit.	rviced of Infon			
Specia	al tools and workshop equipment required	natio			
♦ Mu	ıltimeter. 5	ninth			
♦ Wiring Diagram					
♦ Scan Tool.					
Test r	◆ Scan Tool. Test requirements • Fuses OK. • Battery voltage OK. • Oy ue 62 Mesholo Manufacture of the state of the s				
• Fu	ses OK.	CSWENIC V VOIN			
• Ba	ttery voltage OK.	naper.			
• Sw	Switch OFF all electrical and electronic accessories.				
Ve lev	Vehicles with automatic transmission, ensure the selector lever position is in "P".				
• Ve	hicles with manual transmission, ensure the shifter	lever			

Fuel Delivery Unit - GX1- / Fuel Pump 3.6.17 Relay - J17-, Checking

General Description

- Transfer Fuel Pump G6- .
- Fuel Level Sensor G-.

Special tools and workshop equipment required

- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.

- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 4.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 239 . NO: GATHER more information from customer about the complaint.
3	 IGNITION: OFF. REMOVE: Fuel Pump Relay - J17 Refer to appropriate repair manual. IGNITION: ON. CHECK: Fuel Pump Relay AG17 socket terminals 3/30 and 1/86 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? CONNECT: Jumper wire, between the Fuel 	 YES: GO TO: Step 3 ⇒ page 239. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 240. YES:
4	Pump Relay - J17- socket terminals 3/30 and 5/87. IGNITION: ON. SPECIFIED VALUE: Transfer Fuel Pump - G6- should be heard running. IGNITION: OFF. Was Value obtained? DISCONNECT: Jumper wire, between the Fuel Pump Relay - J17- socket terminals 3/30 and 5/87. REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	 GO TO Step 4 page 239 . NO: GO TO: Step 5 page 240 . YES: REPLACE: Fuel Pump Relay - J17 Refer to appropriate repair manual. GO TO: Step 6 page 240 .
	CHECK: Fuel Pump Relay - J17- socket terminal 2/85 to the Engine Control Module - J623- harness connector T94 / 46 for resistance. SPECIFIED ALUE: 0.5.0 (+0.3.0)	 NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 240.

Step	Procedure	Result / Action to Take
5	DISCONNECT: Jumper wire, between the Fuel Pump Relay - J17- socket terminals 3/30 and 5/87.	 YES: ◆ REPLACE: Fuel Delivery Unit - GX1 Refer to appropriate repair manual.
	DISCONNECT: Fuel Delivery Unit - GX1- harness connector.	♦ GO TO: Step 6 <u>⇒ page 240</u> .
	CHECK: Fuel Pump Relay - J17- socket terminal 5/87 to the Fuel Delivery Unit - GX1-harness connector terminal 1 for resistance.	 NO: ◆ PERFORM: Visual Inspection of wiring and component.
	CHECK: Fuel Delivery Unit - GX1- harness connector terminal 5 to ground for resistance.	♦ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	• SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$.	♦ REPAIR: Faulty wiring or connector.
	- Were Values obtained?	♦ GO TO: Step 6 <u>⇒ page 240</u> .
6	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		 Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17. Return vehicle to Customer.
	as althorised by Volkswagen AG. V	_ NO:

3.6.18 Fuel Injectors, Checking

General Description

The Fuel Injectors are controlled by the Engine Control Module - J623- and are mounted normally in the cylinder head. The fuel injectors spray high-pressure atomized fuel directly into the combustion chamber:

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.
- ◆ LED Test Lamp.

Test requirements

- · Fuses OK.
- Battery voltage OK.

Profected by copy

- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions",
 page 2.
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 241 . NO: GATHER more information from customer about the complaint.
2	 IGNITION: OFF. DISCONNECT: Harness connector from suspect Fuel Injector. CHECK: Suspect Fuel Injector component connector terminals 1 to 2 for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). SPECIFIED VALUE: 150 – 200 kΩ (@ approx. 20° C). 	YES: GO TO: Step 3 ⇒ page 241. NO: REPLACE: Suspect Fuel Injector (s). Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 242.
	- Was Value obtained?	
3	 REMOVE: Engine Control Module - J623-Refer to appropriate repair manual. CHECK: Suspect Fuel Injector harness connector terminal 1 to the Engine Control Module - J623-harness connector T60 / xx for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). CHECK: Suspect Fuel Injector harness connector terminal 2 to the Engine Control Module - J623-harness connector T60 / xx for resistance (refer to appropriate wiring diagram for correct terminal and connector locations). SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: TIP: The Fuel Injector may fail under loaded operation; please swap a known good Fuel Injector prior to continuing to the next step. GO TO: Step 4 ⇒ page 242. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 242.
	Protected by CODY/19th, CODY/19th	-DA nagswealo Vydinginggo i fanto

Step	Procedure		Result / Action to Take	
4 • F	Final Procedure	-	YES: CHECK: Engine Control Module - J623- har-	
• F	Perform a road test to verify repair.		ness connector for any damaged, pushed-out	
- [Does the original DTC return?		pins. REPAIR: As necessary.	
		•	If all electrical connections are OK:	
		'	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.	
		•	Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic	
		*	Mode 04 – Erase DTC Memory ", page 24 . Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17 .	
		•		
		_	NO: Perform the diagnostic procedure for any DTC's.	
		•	If no DTC's return, the repair is complete.	
			Return vehicle to customer.	
· Multime	ols and workshop equipment required eter. Diagram. Diagra		S. C. Pragar	
Fuses OK.				
	voltage OK			
Battery	voltage OK. OFF all electrical and electronic accessories.			
Battery Switch (voltage OK. OFF all electrical and electronic accessories. s with automatic transmission, ensure the selection is in "P".	ecto	or .	
Battery Switch Vehicles lever po	voltage OK. OFF all electrical and electronic accessories. s with automatic transmission, ensure the selection is in "P". s with manual transmission, ensure the shifter is in "N" with the parking brake applied.	ecto	or ver	
Switch (Vehicles lever position	voltage OK. OFF all electrical and electronic accessories. s with automatic transmission, ensure the selection is in "P". s with manual transmission, ensure the shifter is in "N" with the parking brake applied. e all safety precautions: ### 1.1 Safety Precautions:	ector r lev	ver	

3.6.19 Fuel Metering Valve - N290-, Checking

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- View clean working conditions: <u>⇒ "1.2 Clean Working Condi-</u> Protected by copyright, Copyright tions", page 4





1		-
	• PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16.	 YES: GO TO: Step 2 ⇒ page 243 .
	- Was Complaint verified?	 NO: GATHER more information from customer about the complaint.
2	IGNITION: OFF. DISCONNECT: Fuel Metering Valve - N290-harness connector.	 YES: GO TO: Step 3 ⇒ page 243 . NO:
	CHECK: Fuel Metering Valve - N290- component connector terminals 1 to 2 for resistance.	 REPLACE: Fuel Metering Valve - N290 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 244 .
	• SPECIFIED VALUE: 0.5 – 11 Ω (+/- 0.4 Ω @ approx. 20° C).	
	– Was Value obtained?	
3	IGNITION: ON.	- YES:
	CHECK: Fuel Metering Valve - N290- har-	◆ GO TO: Step 4 <u>⇒ page 243</u> .
	ness connector terminal 2 to ground for voltage. • IGNITION: OFF.	 NO: PERFORM: Visual Inspection of wiring and component.
	SPECIFIED VALUE: Battery voltage.	◆ CHECK: Wiring for open, high resistance,
	- Was Value obtained?	short or harness connector for damage, corrosion, loose or broken terminals.
	lakswagen AG. Volkswagen AG does	◆ REPAIR: Faulty wiring or connector.
	Korisetby Volkswagen AG. Volkswagen AG does not gualantee	◆ GO TO: Step 5 ⇒ page 244 .
4552	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual.	- YES: TIP: The Fuel Metering Valve - N290- may
5	CHECK: Fuel Metering Valve - N290- har- ness connector terminal 1 to the Engine Con- trol Module - J623- harness connector T60 /	fail under loaded operation; please swap a known good Fuel Metering Valve - N290- pr or to continuing to the next step.
	60 for resistance.	GO TO: Step 5 <u>⇒ page 244</u> .
	 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 NO: PERFORM: Visual Inspection of wiring and component.
		◆ CHECK: Wiring for open, high resistance, short of harness connector for damage, corrosion, loose or broken terminals.
		REPAIR: Faulty wiring or connector.
		◆ GO TO: Step 5 ⇒ page 244.
		▼ 00 19. Step 3 <u>→ page 244</u> .
BAIL	 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	tion in this oo
TOJEUJAQ	O it is a supplied of	Lips Juffer
	Volkewagen AG. Protected by Copyring	

Step	Procedure	Result / Action to Take
5	Final ProcedurePerform a road test to verify repair.Does the original DTC return?	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
	_	◆ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		◆ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.
		Repair is complete. Generate Readiness Code. Refer to <u>⇒ "3.2 Readiness Code"</u> , page 17
		• Return vehicle to Customer.
		 NO: ◆ Perform the diagnostic procedure for any DTC's.
		♦ If no DTC's return, the repair is complete.
		• Return vehicle to customer.
	- 37 11	

Fuel Pressure Regulator Valve -3.6.20 N276-, Checking

General Description

Jitage OK.

John OFF all electrical and electronic accessories.

Vehicles with automatic transmission, ensure the selector lever position is in "P".

Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.

Observe all safety precautions: ⇒ "1.1 Safety Precautions" vage 2.

ew clean working conditions: ⇒ "1.2 Clean Work' ns", page 4. The Engine Control Module - J623- regulates the Fuel Pressure Regulator Valve - N276-, which is mounted on the fuel pressure rail. The Engine Control Module - J623- uses the fuel pressure input from the Fuel Pressure Sensor - G247-, which is also mounted on the fuel pressure rail.

Special tools and workshop equipment required

Step	Procedure Nolkewagen AG. Volkewa	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. 	- YES: ◆ GO TO: Step 2 page 245 . - NO:
	Was Complaint verified?	GATHER more information from customer about the complaint.
3	 IGNITION: OFF. DISCONNECT: Fuel Pressure Regulator Valve N276- harness connector. CHECK: Fuel Pressure Regulator Valve - N276- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 0.5 – 11 Ω (+/- 0.4 Ω @ approx. 20° C). Was Value obtained? IGNITION: ON. CHECK: Fuel Pressure Regulator Valve - N276- harness connector terminal 2 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. 	 YES: GO TO: Step 3 ⇒ page 245 NO: REPLACE: Fuel Pressure Regulator Valve - N276 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 246 GO TO: Step 4 ⇒ page 245 NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, cor-
	 SPECIFIED VALUE: Battery voltage. Was Value obtained? 	rosion, loose or broken terminals. REPAIR: Faulty wiring or connector. ◆ GO TO: Step 5 ⇒ page 246.
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Fuel Pressure Regulator Valve - N276- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 45 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 YES: TIP: The Fuel Pressure Regulator Valve - N276- may fail under loaded operation; please swap a known good Fuel Pressure Regulator Valve - N276- prior to continuing to the next step. GO TO: Step 5 ⇒ page 246 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
		 REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 246 .

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W
V

Step	Procedure	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed out pins.
	orinv	♦ REPAIR: As necessary.
	part	♦ If all electrical connections are OK:
	oses, in	♦ REPLACE: Engine Control Module - J623- Refer to appropriate repair manual.
	sial purp	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24
	or commercial	◆ Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.
	A A A A A A A A A A A A A A A A A A A	♦ Return vehicle to Customer.
	in post of commercial purposes, in property in propert	 NO: ◆ Perform the diagnostic procedure for any DTC's. ◆ If no DTC's return, the repair is complete. ◆ Return vehicle to customer.

3.6.21 Fuel Pressure Sensor - G247-, Checking

General Description

The Fuel Pressure Sensor - G247- measures the fuel pressure in the high-pressure fuel system. The Engine Control Module -J623- analyzes the signal and regulates the fuel high pressure through the Fuel Pressure Regulator Valve - N276- and the Fuel Metering Valve - N290- in the high pressure fuel pump.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4



Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 247 . NO: GATHER more information from customer about the complaint.
2	 OTIECK: Fuel Pressure 3erisor - G247- Harmoness connector terminals 1 to 3 for voltage. IGNITION: OFF. SPECIFIED VALUE: About 5.0 V Was Value obtained? 	Tee or acceptant lines
3	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Fuel Pressure Sensor - G247- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 40 for resistance. SPECIFIED VALUE: 0.5 Ω ± 0.3 Ω). Was Value obtained? 	 YES: REPLACE: Fuel Pressure Sensor - G247 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 248. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 248.
4	 REMOVE: Engine Control Module J623 Refer to appropriate repair manual. CHECK: Fuel Pressure Sensor - G247- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 53 for resistance. CHECK: Fuel Pressure Sensor - G247- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 25 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: GO TO: Step 5 ⇒ page 248. NO: PERFORM: Visual inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 248.

Step		Procedure , jegotty Volks		Result / Action to Take
5	•	Final Procedure Perform a road test to verify repair. Does the original DTC return?	ness pins.	CK: Engine Control Module - 1623- har- connector for any damaged, pushed-out
		Solving to the whole, is not be seen to the whole, is not be the second to the second	If all e	AIR: As necessary. electrical connections are OK: ACE: Engine Control Module - J623- to appropriate repair manual.
		in part or,	Clear Mode	the DTC's. Refer to ⇒ "3.3.4 Diagnostion 04 – Erase DTC Memory", page 24
		boundi	Repai Code page	ir is complete. Generate Readiness . Refer to ⇒ "3.2 Readiness Code", 17.
		ercial	Retur	n vehicle to Customer.
		The of Comm	NO: Perfor	rm the diagnostic procedure for any
		Salety.	If no [DTC's return, the repair is complete.
		4 EUIAGO		n vehicle to customer.
3.6.22 Fuel Pump Relay 2 / Fuel Pump 2, ON TO THE PUMP 2, ON THE P				
3.6.22 Fuel Pump Relay 2 / Fuel Pump 2, ion Service Se				

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Fuel Pump Relay 2 / Fuel Pump 2, 3.6.22 Checking

General Description

The Fuel Pump Relay 2 provides power to the Fuel Pump 2 as it is cycled on and off by the Engine/Motor Control Module -J623- as necessary.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- Scan Tool.

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4

Test Procedure



Note

- The 2010 1K2 (Jetta) uses the 1AV Fuel Injection System Engine Control Module - J382- / Auxiliary Fuel Pump -V393-.
- The 2011 2014 162 (Jetta) and the 2010 2014 5K1 (Golf) uses the Fuel Pump Relay 2 - J49- / Fuel Pump 2 - V277- .
- The 2010 2014 AJ5 (Jetta SW) uses the Auxiliary Fuel Pump Relay - J832- / Auxiliary Fuel Pump - V393- .
- The 5C1 / 5C7 (Beetle, Beetle Convertible) uses the Fuel Pump Relay 2 - J49- / Auxiliary Fuel Pump - V393- .



Note

The Fuel Pump Relay 2 and the Fuel Pump 2 will be used in this pinpoint for simplicity and consistency.

Step		Procedure	Result / Action to	o Take
1	_	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified?	YES: GO TO: Step 2 <mark>⇒ page 24</mark> NO: GATHER more information about the complaint.	n from customer
3	•	IGNITION: OFF. REMOVE: Fuel Pump Relay 2 from fuse box. Refer to appropriate repair manual. IGNITION: ON. CHECK: Fuel Pump Relay 2 socket terminals 1/86 and 3/30 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? CONNECT: Jumper wire, between the Fuel Pump Relay 2 socket terminals 3/30 and 5/87. IGNITION: ON. SPECIFIED VALUE: Fuel Pump 2 should be heard running. IGNITION: OFF. Was Value obtained?	(ESiagen AG. Volkswagen AG. 30 TO: Step 3 ⇒ page 24 NO: PERFORM: Visual Inspection of the Component. CHECK: Wiring for open, his hort or harness connector osion, loose or broken ter REPAIR: Faulty wiring or component. GO TO: Step 6 ⇒ page 25 NO: Step 5 ¬ pag	tion of wiring and high resistance, r for damage, corminals. connector.
			3. Diagr	nosis and Testing 249

Golf, Jetta, Jetta Wagen 2010 ➤ Volkswagen AG does not gu

4 DISCONNECT: Jumper wire, between the Y	Result / Action to Take
4 DISCONNECT: Jumper wire, between the YI	FC:
	ES: EPLACE: Fuel Pump Relay 2 . Refer to ap- opriate repair manual.
Refer to appropriate repair manual.	O TO: Step 6 <u>⇒ page 250</u> .
CHECK: Fuel Pump Relay 2 socket terminal 2/85 to the Engine Control Module - J623-barness connector T60 / 15 for resistance	O: ERFORM: Visual Inspection of wiring and omponent.
• SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).	HECK: Wiring for open high resistance, nort or harness connector for damage, corsion, loose or broken terminals.
– ≅Was Value obtained?	EPAIR: Faulty wiring of connector.
♦ G	O TO: Step 6 <u>⇒ page 250</u> .
Fuel Pump Relay 2 socket terminals 3/30 and ♦ R	ES: EPLACE: Fuel Pump 2 . Refer to appropri- e repair manual.
DISCONNECT: Fuel Pump Relay 2 harness connector.	O TO: Step 6 <u>⇒ page 250</u> .
CHECK Fuel Pump Relay 2 socket terminal 5/87 to the Fuel Pump Relay 2 harness con-	O: ERFORM: Visual Inspection of wiring and omponent
CHECK: Fuel Pump Relay 2 harness connects share terminal 1 to group of the registered.	HECK: Wiring for open, high resistance, nort or harness connector for damage, corsion, loose or broken terminals.
.DA ~	EPAIR: Faulty wiring or connector.
- Were Values obtained? ♦ G	O TO: Step 6 <u>⇒ page 250</u> .
Perform a road test to verify repair.	ES: HECK: Engine Control Module - J623- har- ess connector for any damaged, pushed-out ns.
	EPAIR: As necessary.
♦ If	all electrical connections are OK:
	EPLACE: Engine Control Module - J623 efer to appropriate repair manual.
	lear the DTC's. Refer to ⇒ <u>"3.3.4 Diagnostic</u> ode 04 – Erase DTC Memory ", page 24 .
C	epair is complete. Generate Readiness ode. Refer to ⇒ "3.2 Readiness Code", age 17.
	eturn vehicle to Customer.
♦ Pe	O: erform the diagnostic procedure for any TC's.
• If	no DTC's return, the repair is complete.
	eturn vehicle to customer.

Fuel Temperature Sensor - G81-, 3.6.23 Checking

General Description

The Fuel Temperature Sensor - G81- sends information about the current fuel temperature to the Engine Control Module -J623- .

Special tools and workshop equipment required

- ♦ Multimeter.
- ♦ Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- · Fuses OK.
- Battery voltage OK.

- Switch OFF all electrical and enc.

 Vehicles with automatic transmission, ensure unclever position is in "P".

 Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.

 " rafety precautions: > "1.1 Safety Precautions",

 Clean Working Condi-

Step	<u>چ</u> Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 251 NO: GATHER more information about the complaint.
2	 IGNITION: OFF. DISCONNECT: Fuel Temperature Sensor - G81-harness connector. CHECK: Fuel Temperature Sensor - G81-component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 2,250 Ω (+/- 750 @ approx. 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 252 NO: REPLACE: Fuel Temperature Sensor - G81 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 252.

Step Procedure	Result / Action to Take
 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Fuel Temperature Sensor - G81-harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 53 for resistance. CHECK Fuel Temperature Sensor - G81-harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 42 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 4 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	PES: TIP: The Fuel Temperature Sensor - G81-may fail under loaded operation; please swap a known good Fuel Temperature Sensor - G81- prior to continuing to the next step. GO TO: Step 4 ⇒ page 252. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 252. YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 24. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete.

3.6.24 Intake Flap Control Unit - GX14-, Checking

General Description

The Intake Flap Control Unit - GX14- is controlled by the Engine Control Module - J623- to increase the EGR rate by reducing the overpressure in the intake manifold. The Intake Manifold Runner Position Sensor - G336- provides the position of the Intake Flap Motor - V157- to the Engine Control Module - J623- .

The Intake Flap Control Unit - GX14- contains the following components:

- ♦ Intake Flap Motor V157- .
- ◆ Intake Manifold Runner Position Sensor G336-.

The Intake Flap Control Unit - GX14- components cannot be serviced separately, and they must be serviced as a unit.

Special tools and workshop equipment required

- Multimeter.
- ♦ Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- · Fuses OK.
- Battery voltage OK.
- · Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions",
 page 2
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 4.

1 • PERFORM: Preliminary Check to verify the - YES:	
customers complaint. Refer to <u>⇒ "3.1 Prelimis</u> ◆ GO TO: Step 2 <u>⇒ page 253</u> . nary Check", page 16 .	mer
Was Complaint verified? • IGNITION: OFF. • REMOVE: Intake Flap Control Unit - GX14- far enough so that the harness connector ter- minals are accessible. • DISCONNECT: Intake Flap Control Unit - GX14- harness connector. • IGNITION: ON. • CHECK: Intake Flap Control Unit - GX14- harness connector terminals 1 to 3 for volt- age. • SPECIFIED VALUE: About 5.0 V. • IGNITION: OFF. - Was Value obtained?	

 Step Procedure Result / Action REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Intake Flap Control Unit - GX14- harness connector T60 / 27 for resistance. CHECK: Intake Flap Control Unit - GX14- harness connector terminal 4 to the Engine Control Module - J623- harness connector T60 / 35 for resistance. CHECK: Intake Flap Control Unit - GX14- harness connector T60 / 35 for resistance. CHECK: Intake Flap Control Unit - GX14- harness connector terminal 5 to the Engine Control Module - J623- harness connector T60 / 50 for resistance. 	Control Unit - GX14 air manual. 254 . ection of wiring and , high resistance, tor for damage, corerminals.
 CHECK: Intake Flap Control Unit - GX14-harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 27 for resistance. CHECK: Intake Flap Control Unit - GX14-harness connector terminal 4 to the Engine Control Module - J623- harness connector T60 / 35 for resistance. CHECK: Intake Flap Control Unit - GX14-harness connector terminal 5 to the Engine Control Module - J623- harness connector Control Module - J623- harnes	air manual. 254 ection of wiring and h, high resistance, tor for damage, cor- erminals.
 CHECK: Intake Flap Control Unit - GX14-harness connector terminal 4 to the Engine Control Module - J623- harness connector T60 / 35 for resistance. CHECK: Intake Flap Control Unit - GX14-harness connector terminal 5 to the Engine Control Module - J623- harness connector 	, high resistance, tor for damage, cor- erminals.
CHECK: Intake Flap Control Unit - GX14- harness connector terminal 5 to the Engine Control Module - J623- harness connector GO TO: Step 5 (Supage 2)	
,10°	<u>254</u> .
 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω) Were Values obtained? 	. according
4 • REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. - YES: GO TO: Step 5 ⇒ page 2	254 . I
CHECK: Intake Flap Control Unit - GX14- harness connector terminal 1 to the Engine Control Module - J623- harness connector T60 / 10 for resistance. CHECK: Intake Flap Control Unit - GX14- harness connector terminal 1 to the Engine component. Component.	pect
CHECK: Intake Flap Control Unit - GX14-harness connector terminal 3 to the Engine Control Module - J623- harness connector CHECK: Wiring for open short or harness connector rosion, loose or broken to the Engine Control Module - J623- harness connector	tor for damage, cor- erminals.
T60 / 51 for resistance. • SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω) • REPAIR: Faulty wiring o	0.00
- Were Values obtained?	nfor
 Final Procedure Perform a road test to verify repair. Does the original DTC return? - YES: CHECK: Engine Control ness connector for any opins. 	
♦ REPAIR: As necessary	iguno
♦ If all electrical connection	ns are OK:
If all electrical connection Refer to appropriate representation Clear the DTC's. Refer to	air manual.
Mode 04 – Erase DTC N	lemory ", page 24 .
Repair is complete. Gen Code. Refer to ⇒ "3.2 Repage 17".	erate Readiness eadiness Code",
◆ Return vehicle to Custor	ner.
 NO: ◆ Perform the diagnostic p DTC's. 	procedure for any
◆ If no DTC's return, the re	epair is complete.
Return vehicle to custom	ner.



General Description

The air mass and charge pressure are two factors used for engine load management. For this purpose, there are several sensors with absolutely identical functions. They measure the intake air temperature and the intake manifold pressure. The Inder u
dule - Job
neasure the pulsual cylinder bank.

actual air mass in the
Intake Manifold Sensor - Goberns:
Intake Air Temperature Sensor - G42-.
Charge Air Pressure Sensor - G31-.
The Intake Manifold Sensor - GX9- components cannoused separately, and they must be serviced as a unit.

Special tools and workshop equipment required AG does not sugarantee.

Wiring Diagram.

Tool.

**Identify the pulsual properties of the pulsual first sender unit is located upstream of the Throttle Valve Control Module - J338/GX3- in the Intake Manifold Sensor - GX9-

- tions", page 4

Step		Procedure	Result / Action to Take
1	_	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3-1 Preliminary Check" page 16. Was Complaint verified?	MO:

Step	Procedu	re	Result / Action to Take
2	 IGNITION: OFF. DISCONNECT: Intake M GX9- harness connector. IGNITION: ON. 	anifold Sensor - -	- YES: • GO TO: Step 3 <u>⇒ page 256</u> . • NO: • GO TO: Step 4 <u>⇒ page 256</u> .
	 CHECK: Intake Manifold ness connector terminals IGNITION: OFF. 	s 1 to 3 for voltage.	
30 See See See See See See See See See Se	REMOVE: Engine Control Refer to appropriate repair to appropriate repair to the Manifold ness connector terminal attrol Module - J623- harner 30 for resistance. CHECK: Intake Manifold ness connector terminal attrol Module - J623- harner 83 for resistance. SPECIFIED VALUE: 0.5 Were Values obtained?	ol Module - J623 air manual. Sensor - GX9- har- 2 to the Engine Con- ess connector T94 / Sensor - GX9- har- 4 to the Engine Con- ess connector T94 /	component CHECK: Witing for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
4 4 4	REMOVE: Engine Contro Refer to appropriate repa CHECK: Intake Manifold ness connector terminal trol Module - J623- harne 66 for resistance. CHECK: Intake Manifold ness connector terminal trol Module - J623- harne 17 for resistance. SPECIFIED VALUE: 0.5	Sensor - GX9- har- 1 to the Engine Con- ess connector T94 / Sensor - GX9- har- 3 to the Engine Con-	component.



Step	Procedure	Result / Action to Take
5	 Final Procedure Perform a road test to verify repair. 	YES: CHECK: Engine Control Module J623- har-
	Does the original DTC return?	ness connector for any damaged, pushed-out pins.
	hole,	♦ REPAIR: As necessary.
	rin w	♦ If all electrical connections are OK:
	in part or in who	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
	poses, i	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.
	mercial pur	Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.
	mos)	♦ Return vehicle to Customer.
	on in particular and confine of c	 NO: ◆ Perform the diagnostic procedure for any DTC's.
	41/6003 11/6	♦ If no DTC's return, the repair is complete.
	"Opposition of the state of the	Return vehicle to customer.
	Profection	-DA napring.

3.6.26 Mass Airflow Sensor - G70-, Checking

General Description

The signal from the Mass Airflow Sensor - G70- is used in the Engine Control Module - J623- to calculate the volumetric efficiency. Based on the volumetric efficiency, and taking into consideration the lambda value and ignition timing, the Engine Control Module - J623- calculates the engine torque.

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions", page 2.
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.

Step		Procedure	Result / Action to Take
1	•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16.	 YES: GO TO: Step 2 ⇒ page 258 .
	_	Was Complaint verified?	 NO: GATHER more information from customer about the complaint.
2	•	IGNITION: OFF. CONNECT: Scan tool . START: Engine and let Idle. CHECK: The air flow quantity of the Mass Air Flow Sensor - G70	 YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, cor-
	•	SPECIFIED VALUE: About 6 to 9 g/s. IGNITION: OFF. Was Value obtained?	rosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 5 ⇒ page 259 . - NO: ◆ GO TO: Step 3 ⇒ page 258 .
3		DISCONNECT: Mass Air Flow Sensor - G70-harness connector. IGNITION: ON. CHECK: Mass Air Flow Sensor - G70- harness connector terminal 5 to ground for voltage. SPECIFIED VALUE: Battery voltage.	 YES: GO TO: Step 4 ⇒ page 258. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	• -	IGNITION: OFF. Was Value obtained?	REPAIR: Fiaulty wiring or connector. GO TO: Step 5 ⇒ page 259 GO TO: Step 5 → page 259 GO TO: Step 5 → page 259
4	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual CHECK: Mass Air Flow Sensor G70- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 18 for resistance. CHECK: Mass Air Flow Sensor - G70- har-	 YES: REPLACE: Mass Airflow Sensor - G70 Refer to appropriate repair manual. GO TO: Step 5 ⇒ page 259 . NO: PERFORM: Visual Inspection of wiring and component.
		ness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 23 for resistance. CHECK: Mass Air Flow Sensor - G70- harness connector terminal 4 to the Engine Control Module - J623- harness connector T94 / 39 for resistance. SPECIFIED VALUE: $0.5 \Omega (\pm 0.3 \Omega)$. Were Values obtained?	 CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 259.
	I	Were Values obtained?	A Daloelord Protected by Mainting of Protected





Step	Procedure	Result / Action to Take		
5	Final Procedure	- YES:		
	Perform a road test to verify repair.	◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out		
	– Does the original DTC return?	pins.		
		REPAIR: As necessary.		
		If all electrical connections are OK:		
		REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.		
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.		
		Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17.		
		Return vehicle to Customer.		
		 NO: ◆ Perform the diagnostic procedure for any DTC's. 		
		♦ If no DTC's return, the repair is complete.		
		Return vehicle to customer.		
3.6.27 Outside Air Temperature Sensor - G17- , Checking General Description The ambient or Outside Air Temperature Sensor - G17- is a negative temperature coefficient (NTC) sensor that informs the semiautomatic / automatic temperature control system of outside air temperature an NTC sensor resistance decreases as the temperature increases, and the sensor resistance decreases as the temperature increases, and the sensor resistance increases as the temperature decreases. The computer uses this input along with different in-car temperature sensors to control temperature and blower speed. When there is a problem with this sensor, performance will suffer and the A/C compressor clutch may not engage. Special tools and workshop equipment required ♠ Multimeter. ♠ Wiring Diagram. ♣ Scan Tool. Test requirements • Fuses OK. Battery voltage OK. • Switch OFF all electrical and electronic accessories. • Vehicles with automatic transmission, ensure the selector lever position is in "P". • Vehicles with manual transmission, ensure the shifter lever position is in "P". • Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied. • Observe all safety precautions: ⇒ "1.1 Safety Precautions".				
-	al tools and workshop equipment required	ktoth		
	ultimeter.	ecor		
	ring Diagram.	rectn		
	an Tool.	es s		
	requirements	f info		
 ◆ Wiring Diagram. ◆ Scan Tool. Test requirements • Fuses OK. • Battery voltage OK. 				
Battery voltage OK. Switch OFF all all attributes and a second price.				
Switch OFF all electrical and electronic accessories. Validate with put an attachment accessories.				
Vehicles with automatic transmission, ensure the selector lever position is in "P". The selector lever position is in "P".				
pos	hicles with manual transmission, ensure the shiften sition is in "N" with the parking brake applied.	r lever		
Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.				
		3. Diagnosis and Testing 25		

3.6.27 Outside Air Temperature Sensor -G17-, Checking

General Description

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.



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Test Procedure



Note

- The 2011 2014 162 (Jetta), 2010 2014 5K1 (Golf) use the T32 cluster connector.
- The 2013 2014 5C1 (Beetle) uses the T32b cluster connector
- The 2010 1K2 (Jetta), 2010 2014 AJ5 (Jetta SW), 2013 2014 5C7 (Beetle convertible) use the T32c cluster connec-



Note

	Generic Scan Tool - Edition 09.2023				
• View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4.					
 View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4. Test Procedure Note The 2011 – 2014 162 (Jetta), 2010 – 2014 5K1 (Golf) use the T32 cluster connector. The 2013 – 2014 5C1 (Beetle) uses the T32b cluster connector. The 2010 1K2 (Jetta), 2010 – 2014 AJ5 (Jetta SW), 2013 – 2014 5C7 (Beetle convertible) use the T32c cluster connector. Note The T32 cluster connector designation will be used for simplicity and consistency. Step Procedure Procedure Result / Action to Take 					
O4	7-1-1/1 ₀₀ -1 ₀₀ -	LINSHOA KONY			
Step	Procedure of the state of the s	Result / Action to Take			
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 260 . NO: GATHER more information from customer about the complaint. 			
2	 IGNITION: OFF. DISCONNECT: Outside Air Temperature Sensor - G17- harness connector. CHECK: Outside Air Temperature Sensor - G17- component connector terminals 1 to 2 for resistance. SPECIFIED VALUE: 1,300 Ω (+/- 500 Ω @ approx. 20° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 260 . NO: REPLACE: Outside Air Temperature Sensor - G17 Refer to appropriate repair manual. GO TO: Step 4 ⇒ page 261 . 			
3	 REMOVE: Instrument Cluster Control Module - J285 Refer to appropriate repair manual. CHECK: Outside Air Temperature Sensor - G17- harness connector terminal 1 to the Instrument Cluster Control Module - J285- harness connector T32 / 20 for resistance. CHECK: Outside Air Temperature Sensor - G17- harness connector terminal 2 to the Instrument Cluster Control Module - J285- harness connector T32 / 19 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 YES: TIP: The Outside Air Temperature Sensor - G17- may fail under loaded operation; please swap a known good Outside Air Temperature Sensor - G17- prior to continuing to the next step. GO TO: Step 4 ⇒ page 261 . NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 261 . 			



Step	Procedure	Result / Action to Take
4	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	→ YES: ◆ CHECK: Instrument Cluster Control Module - J285- harness connector for any damaged, pushed-out pins. ◆ REPAIR: As necessary.
	vhole	♦ If all electrical connections are OK:
	npart or in whole, is n	REPLACE: Instrument Cluster Control Module - J285 Refer to appropriate repair manual.
	poses, ii	◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory ", page 24.
	mercial pur	◆ Repair is complete. Generate Readiness Code. Refer to <u>⇒ "3.2 Readiness Code", page 17</u> .
	in the state of th	♦ Return vehicle to Customer.
	DA negotora DA neg	 NO: ◆ Perform the diagnostic procedure for any DTC's.
	(Malo) 11	♦ If no DTC's return, the repair is complete.
	140 _{IJ} Aq _O DAQ _O DAQ	Return vehicle to customer.
	JA nag	Bus

3.6.28 Oxygen Sensor 1 After Catalytic Converter - GX7-, Checking

General Description

The Oxygen Sensor 1 After Catalytic Converter - GX7- is positioned downstream of the primary catalytic converter and it supplies the Engine Control Module - J623- with a voltage signal (nonlinear) indicating a "rich" or a "lean" condition is present. If the primary catalytic converter is supersaturated with oxygen (indicating a lean mixture is present), the Oxygen Sensor 1 After Catalytic Converter - GX7- will send the Engine Control Module - J623- a nonlinear signal indicating the lean mixture condition. The mixture is then enriched with fuel until the oxygen has been "displaced" from the catalytic converter. This new condition, in turn, is registered by the Oxygen Sensor 1 After Catalytic Converter - GX7- as a nonlinear signal indicating the rich mixture condition. The mixture is then leaned out by the Engine Control Module - J623- . If the nonlinear signal is received again, the mixture will again be enriched. The frequency, or period, during which the mixture is enriched or leaned out is variable, being dependent on the gas flow rate (engine load) at that moment.

Note the Oxygen Sensor 1 After Catalytic Converter - GX7- is also known as the Oxygen Sensor After Three Way Catalytic Converter - G130- .

The Oxygen Sensor 1 After Catalytic Converter - GX7- contains the following components:

- Oxygen Sensor After Three Way Catalytic Converter -G130- .
- Heater For Oxygen Sensor 1 After Catalytic Converter -Z29- .

The Oxygen Sensor 1 After Catalytic Converter - GX7- components cannot be serviced separately, and they must be serviced

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- View clean working conditions 1.2 Clean Working Conditions", page 4

• Ve	chicles with manual transmission, ensure the shiften sition is in "N" with the parking brake applied.	rlever			
• Ok	Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied. Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2. View clean working conditions: "1.2 Clean Working Conditions", page 4. est Procedure				
• Vie	ew clean working conditions: 4.2 Clean Working ns", page 4	Condi-			
Test F	Procedure	Dian.			
Step	§ Procedure	Result / Action to Take			
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to Oxygen Sensor Preliminary Tests in ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 262 NO: GATHER more information from customer about the complaint. 			
2	 IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter GX7- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C). Was Value obtained? 	 YES: GO TO: Step 3 ⇒ page 262 NO: REPLACE: Oxygen Sensor 1 After Catalytic Converter - GX7 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 264 			
3	IGNITION: ON. CHECK: Oxygen Sensor After Catalytic Converter - GX7- harness connector terminal 4 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained?	 YES: GO TO: Step 4 ⇒ page 263. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. 			
		 REPAIR. Faulty willing of connector. GO TO: Step 6 ⇒ page 264. 			



 START: Engine and let Idle. Perform the function test located in Diagnostic Mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, ⇒ "3.3 Diagnostic Modes 01 - 09", page 19. IGNITION: OFF. SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? REMOVE: Engine Control Module - J623 - Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector terminal 1 to the Engine Control Module - J623 - harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector terminal 2 to the Engine Control Module - J623 - harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector terminal 3 to the Engine Control Module - J623 - harness connector T94 / 55 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector terminal 3 to the Engine Control Module - J623 - harness connector T94 / 55 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector terminal 3 to the Engine Control Module - J623 - harness connector T94 / 55 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector terminal 5 to the Engine Control Module - J623 - harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector terminal 5 to the Engine Control Module - J623 - harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7 - harness connector terminal 5 to the Engine Control Module - J623 - harness connector T94 / 58 for resistance. 	Step	Procedure	Result / Action to Take
 START: Engine and let Idle. Perform the function test located in Diagnostic Mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, ⇒ "3.3 Diagnostic Modes 01 – 09", page 19 IGNITION: OFF. SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 	4	RECONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector.	
 START: Engine and let Idle. Perform the function test located in Diagnostic Mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, ⇒ "3.3 Diagnostic Modes 01 - 09", page 19. IGNITION: OFF. SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 5 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 5 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 5 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 	•	CONNECT: Scan Tool.	◆ PERFORM: Visual Inspection of wiring and
 Perform the function test located in Diagnostic Mode 06. Refer to appropriate Diagnostic Mode 06. Refer to appropriate Diagnostic Modes 01 – 09 ", page 19. IGNITION: OFF. SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 	•	START: Engine and let Idle.	·
 agnostic Functions, ⇒ "3.3 Diagnostic Modes 01 – 09", page 19 IGNITION: OFF. SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 		tic Mode 06. Refer to appropriate Diagnostic	short or harness connector for damage, cor-
 IGNITION: OFF. SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? REMOVE: Engine Control Module - J623- Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 		agnostic Functions, ⇒ "3.3 Diagnostic Modes	REPAIR: Faulty wiring or connector.
 SPECIFIED VALUE: Mode 6 Pass. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 	.	• •	
 Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 		SPECIFIED VALUE: Mode 6 Pass.	
 Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 5 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 	-	- Were Values obtained?	
 DISCONNECT: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. 	5 •		◆ REPLACE: Oxygen Sensor 1 After Catalytic
 1 to the Engine Control Module - J623- harness connector T94 / 80 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic CHECK: Oxygen Sensor 1 After Catalytic 	•		manual.
 Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- harness connector T94 / 59 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic 	•	Converter - GX7- harness connector terminal 1 to the Engine Control Module - J623- har	◆ PERFORM: Visual Inspection of wiring and
 CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- harness connector T94 / 51 for resistance. CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance. CHECK: Oxygen Sensor 1 After Catalytic 	•	Converter - GX7- harness connector terminal 2 to the Engine Control Module - J623- har-	short or harness connector for damage, cor-
Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- harness connector T94 / 58 for resistance.	•	CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 3 to the Engine Control Module - J623- har-	♦ GO TO: Step 6 ⇒ page 264 .
 CHECK: Oxygen Sensor 1 After Catalytic Converter - GX7- harness connector terminal 6 to the Engine Control Module - J623- harness connector T94 / 81 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	•	Converter - GX7- harness connector terminal 5 to the Engine Control Module - J623- har-	
 SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	•	Converter - GX7- harness connector terminal 6 to the Engine Control Module - J623- har-	
- Were Values obtained?	•	SPECIFIED VALUE: $0.5 \stackrel{\frown}{\Omega} (\pm 0.3 \Omega)$.	won,
"Hardy Rilling		- Were Values obtained?	
DAngewagen Protected by Copyright, Co.		THO TO THOM TOO SHOW	DA negenestion Volkewagen AG. Protected by Walfelingo Jirgingo Jir

Step	Procedure	Result / Action to Take
6	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins.
		♦ REPAIR: As necessary.
		◆ If all electrical connections are OK:
		◆ REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.
		◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.
	isedby Volkswagen AG. Volkswagen AG.	◆ Repair is complete. Generate Readiness Code. Refer to <u>⇒ "3.2 Readiness Code", page 17</u> .
	Sautron	◆ Return vehicle to Customer.
	of Soliting Under Statuton is ed by Volkswagen AG. Volkswagen AG. Volkswagen AG.	 NO: ◆ Perform the diagnostic procedure for any DTC's.
	DOU	♦ If no DTC's return, the repair is complete.
	hole, is	Return vehicle to customer.

Adalytic Converter - GX10- does
And of oxygen in the exhaust gas and
And This demand causes a voltage to build up,
Asportation of oxygen ions through the Oxygen Sensor 1 Before Catalytic Converter - GX10- layer. A lean mixture
Auses a low voltage, since there is an oxygen excess. The
Oxygen Sensor 1 Before Catalytic Converter - GX10- and catalytic converters are used in order to reduce exhaust emissions.
Information on oxygen concentration is sent to the Engine Control Module - J623-, which adjusts the amount of fuel injected into the engine to compensate for excess air or excess fuel.
The Engine Control Module - J623- attempts to maintain, on verage, a certain air-fuel ratio by interpreting the informating gains from the Oxygen Sensor 1 Before Catalytic Cor
X10-. The primary goal is a compromise between onomy, and emissions. The heater for the Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-readiness for closed-loon gen Sensor 1 Before Catalytic Converter - GX10- is d' time-to-rea

tains the following components:

- Heated Oxygen Sensor G39- .
- Oxygen Sensor Heater Z19- .

The Oxygen Sensor 1 Before Catalytic Converter - GX10- components cannot be serviced separately, and they must be serviced as a unit.

Special tools and workshop equipment required

- ♦ Multimeter.
- ♦ Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- · Fuses OK.
- · Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions",
 page 2.
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 4.

Step	Procedure	Result / Action to Take			
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to Oxygen Sensor Preliminary Tests in ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 265 . NO: GATHER more information from customer about the complaint. 			
2	 IGNITION: OFF. DISCONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- component connector terminals 3 to 4 for resistance. SPECIFIED VALUE: 2 – 4 Ω (+/- 0.5 Ω @ 25° C). Was Value obtained? 	 ColkYES:nAG GO TO: Step 3 ⇒ page 265 NO: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual. GO TO: Step 6 ⇒ page 267 			
3	 IGNITION: ON. CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 4 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Was Value obtained? 	 YES: GO TO: Step 4 ⇒ page 266. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 267. 			
A No No West Barried of the Washington of the Manual of th					

Step		Procedure gran AG. Volkswage	n A	Result / Action to Take
4	•	RECONNECT: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector.	-	YES: FAULT: Is intermittent.
	•	CONNECT: Scan Tool.	♦	PERFORM: Visual Inspection of wiring and component.
	•	START: Engine and let Idle. Perform the function test located in Diagnostic Mode 06. Refer to appropriate Diagnostic Mode 06 - Read Test Results for Specific Diagnostic Functions, > "3.3 Diagnostic Modes 01 - 09", page 19.	•	CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
	•	IGNITION: OFF.	*	GO TO: Step 6 ⇒ page 267 . NO:
	•	SPECIFIED VALUE: Mode 6 Pass.	*	GO TO: Step 5 <u>⇒ page 266</u> .
	-	Were Values obtained?		VEC.
5	•	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. DISCONNECT: Oxygen Sensor 1 Before	*	YES: REPLACE: Oxygen Sensor 1 Before Catalytic Converter - GX10 Refer to appropriate repair manual.
		Catalytic Converter - GX10- harness connector.	•	GO TO: Step 6 ⇒ page 267.
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 1 to the Engine Control Module - J623-harness connector T94 / 77 for resistance.	•	NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance,
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10-harness connector terminal 2 to the Engine Control Module - J623-harness connector T94 / 56 for resistance.	7	short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector.
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 3 to the Engine Control Module - J623-harness connector T94 / 73 for resistance.	₽ \	GO TO: Step 6 <u>⇒ page 267</u> .
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector terminal 5 to the Engine Control Module - J623-harness connector T94 / 55 for resistance.		
	•	CHECK: Oxygen Sensor 1 Before Catalytic Converter - GX10- harness connector termi- nal 6 to the Engine Control Module - J623- harness connector T94 / 78 for resistance.		
	•	SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω).		
	_	Were Values obtained?		



Step	Procedure	Result / Action to Take					
6	 Final Procedure Perform a road test to verify repair. Does the original DTC return? 	 YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. 					
	- Does the original DTC return:	REPAIR: As necessary.					
	- 7	♦ df alkelectrical connections are OK:					
	holised by Volksway	REPLACE: Engine Control Module - J623 Refer to appropriate repair manual.					
	Aug Stauth	◆ Clear the DTC's. Refer to ⇒ "3,3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24.					
	- Does the original DTC return? REPAIR: As necessary. Af all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ 3.3.4 Diagnostic Mode 04 – Erase DTC Memory" page 24. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.						
	96,16,	Return vehicle to Customer.NO:					
	rt or in who	 NO: ◆ Perform the diagnostic procedure for any DTC's. 					
	in	♦ If no DTC's return, the repair is complete.					
	poses,	 ♦ If no DTC's return, the repair is complete. ♦ Return vehicle to customer. 					
3.6.30 Terminal 30 Power Supply Relay - J317-, Checking General Description The Terminal 30 Power Supply Relay - J317- is used to provide power to the Fuse Panel B - SB-, located in the engine compartment. Special tools and workshop equipment required Multimeter. Wiring Diagram. Scan Tool.							
	ral Description						
The Terminal 30 Power Supply Relay - J317- is used to provide power to the Fuse Panel B - SB-, located in the engine compartment.							
Special tools and workshop equipment required							
♦ Mu	lltimeter.	ng BA negsure.					
♦ Wii	ring Diagram.						
♦ Sca	an Tool.						
Test ro	Test requirements						

Terminal 30 Power Supply Relay -3.6.30 J317-, Checking

General Description



- ◆ Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4

2 · I · E · I · I · I · I · I · I · I · I	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified? IGNITION: OFF. DISCONNECT: Terminal 30 Power Supply Relay - J317- from the Fuse Panel B - SB-in the engine compartment. IGNITION: ON. CHECK: Terminal 30 Power Supply Relay - J317- socket terminals 30 and 86 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 NO: GATHER more information from custome about the complaint. YES: GO TO: Step 3 ⇒ page 268. NO: PERFORM: Visual Inspection of wiring a component. CHECK: Wiring for open, high resistance short or harness connector for damage, or rosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 269. YES: GO TO: Step 4 ⇒ page 268. NO: GO TO: Step 5 ⇒ page 269.
2 · I · E · I · I · I · I · I · I · I · I	IGNITION: OFF. DISCONNECT: Terminal 30 Power Supply Relay - J317- from the Fuse Panel B - SB-in the engine compartment. IGNITION: ON. CHECK: Terminal 30 Power Supply Relay - J317- socket terminals 30 and 86 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 GATHER more information from custome about the complaint. YES: GO TO: Step 3 ⇒ page 268. NO: PERFORM: Visual Inspection of wiring a component. CHECK: Wiring for open, high resistance short or harness connector for damage, or rosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 269. YES: GO TO: Step 4 ⇒ page 268. NO: GO TO: Step 5 ⇒ page 269.
3 · F · · · · · · · · · · · · · · · · ·	DISCONNECT: Terminal 30 Power Supply Relay - J317- from the Fuse Panel B - SB-in the engine compartment. IGNITION: ON. CHECK: Terminal 30 Power Supply Relay - J317- socket terminals 30 and 86 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 GO TO: Step 3 ⇒ page 268. NO: PERFORM: Visual Inspection of wiring a component. CHECK: Wiring for open, high resistance short or harness connector for damage, or rosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 269. YES: GO TO: Step 4 ⇒ page 268. NO: GO TO: Step 5 ⇒ page 269.
3 · F · · · · · · · · · · · · · · · · ·	Relay - J317- from the Fuse Panel B - SB- in the engine compartment. IGNITION: ON. CHECK: Terminal 30 Power Supply Relay - J317- socket terminals 30 and 86 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 NO: PERFORM: Visual Inspection of wiring a component. CHECK: Wiring for open, high resistance short or harness connector for damage, or rosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 269. YES: GO TO: Step 4 ⇒ page 268. NO: GO TO: Step 5 ⇒ page 269.
3 · F · () - () - () - () - () - () - () - () -	CHECK: Terminal 30 Power Supply Relay - J317- socket terminals 30 and 86 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 CHECK: Wiring for open, high resistance short or harness connector for damage, or rosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 269. YES: GO TO: Step 4 ⇒ page 268. NO: GO TO: Step 5 ⇒ page 269.
3 · F · · · · · · · · · · · · · · · · ·	J317- socket terminals 30 and 86 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	short or harness connector for damage, or rosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 269. YES: GO TO: Step 4 ⇒ page 268. NO: GO TO: Step 5 ⇒ page 269.
3 · F · · · · · · · · · · · · · · · · ·	SPECIFIED VALUE: Battery voltage. Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 GO TO: Step 6 ⇒ page 269. YES: GO TO: Step 4 ⇒ page 268. NO: GO TO: Step 5 ⇒ page 269.
- \\ 3	Were Values obtained? REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 YES: GO TO: Step 4 ⇒ page 268 . NO: GO TO: Step 5 ⇒ page 269 .
3 • F F • C C r t t • C C r t t • C C c c t t • C C c c c c c c c c c c c c c c c c c	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 GO TO: Step 4 ⇒ page 268 . NO: GO TO: Step 5 ⇒ page 269 .
- N	Refer to appropriate repair manual. CONNECT: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	 GO TO: Step 4 ⇒ page 268 . NO: GO TO: Step 5 ⇒ page 269 .
- N	nal 30 Power Supply Relay - J317- socket terminals 30 and 87. IGNITION: ON. CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	◆ GO TO: Step 5 <u>⇒ page 269</u> .
• (r t t •)	CHECK: Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	
4 • F	ness connector T94 / 3, T94 / 5, and T94 / 6 to ground for voltage. IGNITION: OFF. SPECIFIED VALUE: Battery voltage.	
- V 4 • F • C	SPECIFIED VALUE: Battery voltage.	
- \ 4 • F r t t	, ,	AG Volkswagen
4 • F	M M. I I. (. ! IO	Nolkswagen AC. Vollowagen AG does not a
• (c)	Were Values obtained?	worised by Volkswagen AG. Volkswagen AG does not guara
t 6	REMOVE: Jumper wire, between the Terminal 30 Power Supply Relay - J317- socket terminals 30 and 87.	 YES: REPLACE: Terminal 30 Power Supply Repair - J317 Refer to appropriate repair manual
• 5	CHECK: Terminal 30 Power Supply Relay - J317- socket terminal 85 to the Engine Con- trol Module - J623- harness connector T94 /	◆ GO TO: Step 6 <u>⇒ page 269</u> . – NO:
	69 for resistance.	 PERFORM: Visual Inspection of wiring a component.
- \	SPECIFIED VALUE: 0.5Ω (± 0.3Ω). Was Value obtained?	 CHECK: Wiring for open, high resistance short or harness connector for damage, or rosion, loose or broken terminals.
	s, in p	♦ REPAIR: Faulty wiring or connector.
	esod	◆ GO TO: Step 6 <u>⇒ page 269</u> .
	Was Value obtained? Was Value obtained? Pep. Gr.ST - Generic Scan Tool	
		Protected by Volkswayer AG.
.68 Re		
	ep. Gr.ST - Generic Scan Tool	- PAnaganayor





Step	Procedure	Result / Action to Take
5	 REMOVE: Jumper wire, between the Termi- nal 30 Power Supply Relay - J317- socket terminals 30 and 87. 	YES: REPLACE: Fuse Panel B - SB- fuse box. Refer to appropriate repair manual.
	 REMOVE: Appropriate fuse (refer to appropriate wiring diagram for correct fuse). CHECK: Downstream (output) side of Appropriate fuse to the Engine Control Module - J623- harness connector T94 / 3, T94 / 5, and T94 / 6 for resistance (refer to appropriate wiring diagram for correct fuse). SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? 	 GO TO: Step 6 ⇒ page 269 NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 6 ⇒ page 269
	Perform a read test to verify repair. Does the original DTC return? Page 100 100 100 100 100 100 100 100 100 10	 YES: CHECK: Engine Control Module J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623- Refer to appropriate repair manual. Clear the DTC's Refer to ⇒ "3.3.4 Diagnostic Mode 04 Perase DTC Memory", page 24. Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17. Return vehicle to Customer. NO: Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete. Return vehicle to customer.

3.6.31 Three Way Catalytic Converter (TWC), Checking

General Description

A catalytic converter is a vehicle emissions control device that converts toxic pollutants in exhaust gas to less toxic pollutants by catalyzing a redox reaction (oxidation or reduction). Catalytic converters are used in internal combustion engines.

General recommendations

Oxygen sensors OK.

No leaks or damage to exhaust system.

Prior to repair work, perform a preliminary check to verify the condition. Refer to ⇒ "3.1 Preliminary Check", page 16.

Test requirements

- · Fuses OK.
- · Battery voltage OK.

- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions",
- View clean working conditions: ⇒ "1.2 Clean Working Conditions", page 4

Test Procedure

Step	Procedure	Result / Action to Take				
1	Activate Monitors: • Perform the function test in Diagnostic Mode 06. Refer to appropriate Diagnostic Mode 06 – Read Test Results for Specific Diagnostic Functions, ⇒ "3.3 Diagnostic Modes 01 – 09 ", page 19. • End diagnosis and switch the ignition off.	 Check the exhaust system for leaks. If necessary, repair the leak(s) in the exhaust system. GO TO: Step 2 ⇒ page 270 . 				
	If the specified values are exceeded:					
2	 O2 Sensor Monitoring: Erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24. Perform a road test to verify repair. If the DTC does not return: 	 Generate readiness code. Refer to ⇒ "3.2 Readiness Code", page 17 If no leaks are found in the exhaust system: Replace the catalytic converter with front exhaust pipe. Refer to appropriate repair manual. GO TO: Step 3 ⇒ page 270 				
• Final procedure: • Perform a road test to verify repair. • Perform a road test to verify repair. • After the repair work, the following work steps must be performed in the following sequence: • Check the DTC memory. Refer to ⇒ "3.3.3 Diagnostic Mode 03 – Read DTC Memory", page 23. • If necessary, erase the DTC memory. Refer to ⇒ "3.3.4 Diagnostic Mode 04 – Erase DTC Memory", page 24. • If the DTC memory was erased, generate readiness code. Refer to ⇒ "3.2 Readiness Code", page 17. • Return vehicle to Customer. 3.6.32 Throttle Valve Control Module - GX3-, Checking						
3.6.32 Throttle Valve Control Module - GX3- , Checking						
General Description						
General Description The throttle valve operation occurs by an electric motor identified located within the Throttle Valve Control Module - GX3-Olt is controlled by the Engine Control Module - J623- with primary inputs from the Accelerator Pedal Module - GX2- as well as other peripheral inputs. Note the Throttle Valve Control Module - GX3- is also referred to as the Throttle Valve Control Module - J338						
270 Rep. Gr.ST - Generic Scan Tool						

Throttle Valve Control Module - GX3-, 3.6.32 Checking

General Description





The Throttle Valve Control Module - GX3 / J338- contains the following components:

◆ Throttle Position Sensor - G69- .

The Throttle Valve Control Module - GX3 / J338- components cannot be serviced separately, and they must be serviced as a

Special tools and workshop equipment required

- Multimeter.
- Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- Fuses OK.
- Battery voltage OK.
- Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions: ⇒ "1.1 Safety Precautions", <u>page 2</u> .
- View clean working conditions: 4.2 Clean Working Condi-In ... S not guarantee o. tions", page 4√o

	Step	50	Procedure	QC.	Result / Action to Take
10th		•	PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16.	- ♦	YES: GOTO: Step 2 ⇒ page 271 . NO:
commercial purposes, in part or in whole, is ho		_	Was Complaint verified?	•	GATHER more information from customer about the complaint.
orin	2	•	IGNITION: OFF.	-	YES: 6 CONDITION: May be intermittent.
part		٠	CONNECT: Scan Tool.		PERFORM: Visual Inspection of wiring and
es, in		•	IGNITION: ON.		component.
rpos		٠	CHECK: Throttle valve position closed:	*	CHECK: Wiring for open, high resistance,
alpu		•	SPECIFIED VALUE: 3 – 25%.		short or harness connector for damage, corrosion, loose or broken terminals.
mmerci		•	DEPRESS: Accelerator pedal slowly to WOT while observing the percentage display. The	•	REPAIR: Faulty wiring or connector.
4			percentage display must increase uniformly.	*	GO TO: Step 5 <u>⇒ page 272</u> .
	o en	•	CHECK: Throttle valve position at WOT:	-	NO.
	STENIIO 1016	•	SPECIFIED VALUE: 84 – 97%.	•	GO TO: Step 3 <u>⇒ page 272</u> .
		60	IGNITION: OFF.	ر. تر.	
		- `	Were Values obtained?		
•			Protected by Notected by Son Protected by Son		

Step	Procedure	Result / Action to Take
3 .	REMOVE: Throttle Valve Control Module - GX3- far enough so that the harness connector terminals are accessible. DISCONNECT: Throttle Valve Control Module - GX3- harness connector. IGNITION: ON. CHECK: Throttle Valve Control Module - GX3- harness connector terminals 1 to 2 for	 YES: GO TO: Step 4 ⇒ page 272. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals.
	voltage. IGNITION: OFF.	 REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 272.
-	SPECIFIED VALUE: Battery voltage.	
• - 5 •	REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Throttle Valve Control Module - GX3- harness connector terminal 3 to the Engine Control Module - J623- harness connector T60 / 30 for resistance. CHECK: Throttle Valve Control Module - GX3- harness connector terminal 4 to the Engine Control Module - J623- harness connector T60 / 11 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Were Values obtained? Final Procedure Perform a road test to verify repair. Does the original DTC return?	 ◆ CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. ◆ REPAIR: Faulty wiring or connector. ◆ GO TO: Step 5 ⇒ page 272. YES: ◆ CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. ◆ REPAIR: As necessary. ◆ If all electrical connections are OK: ◆ REPLACE: Engine Control Module - J623- Refer to appropriate repair manual. ◆ Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 = Erase DTC Memory", page 24. ◆ Repair is complete. Generate Readiness Code Refer to ⇒ "3.2 Readiness Code", page 17. ◆ Return vehicle to Customer.

3.6.33 Vehicle Speed Signal, Checking

General Description

The Vehicle Speed Signal or VSS measures Transmission / Transaxle output or Wheel Speed from the ABS. The signal is



broadcasted over the CAN Bus. The Engine Control Module - J623- uses this information to modify engine functions such as ignition timing, A/F ratio, transmission shift points, and to initiate diagnostic routines.

Special tools and workshop equipment required

- ◆ Multimeter.
- ♦ Wiring Diagram.
- ♦ Scan Tool.

Test requirements

- · Fuses OK.
- Battery voltage OK.
- · Switch OFF all electrical and electronic accessories.
- Vehicles with automatic transmission, ensure the selector lever position is in "P".
- Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.
- Observe all safety precautions:
 ⇒ "1.1 Safety Precautions",
 page 2.
- View clean working conditions:
 ⇒ "1.2 Clean Working Conditions", page 4.

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to 3.1 Preliminary Check", page 16. Was Complaint verified? 	 YES: AG does not page 273 and page 273 and
2	 IGNITION: OFF CONNECT: Scan Tool. ROAD TEST: Vehicle. CHECK: Scan Tool to Speedometer for accuracy. SPECIFIED VALUE: Difference ≤ 10%. Was Value obtained? 	 YES: CONDITION: May be intermittent. PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 4 ⇒ page 274. NO: GO TO: Step 3 ⇒ page 273.
3	CHECK: ABS DTC's. Was the ABS OK? UBUILDO APPROAD UBUILDO APPROAD OR APPR	 YES: CHECK: CAN Bus wiring from the Instrument Cluster Control Module - J285² to the ABS Control Module - J104 GO TO: Step 4 ⇒ page 274 . NO: REPAIR: Any ABS concerns 1st. GO TO: Step 4 ⇒ page 274 .

Step	Procedure	Result / Action to Take		
4	Final ProcedurePerform a road test to verify repair.Do any DTC's return:	 YES: Check the DTC memory. Refer to ⇒ "3.3.3 E agnostic Mode 03 – Read DTC Memory ", page 23 . 		
	Boarry DTO STetum.	 Perform the diagnostic procedure for that DTC. 		
		 NO: Repair is complete. Generate readiness code. Refer to ⇒ "3.2 Readiness Code", page 17. 		
		Return vehicle to Customer.		
a.6.34 Wastegate Bypass Regulator Valve - N75- , Checking General Description 3oth the boost and intake pressures are used to control the wastegate of the turbocharger. These pressure signals are supplied to the Engine Control Module - J623 which then sends a value within modulated signal to the Wastegate Bypass Regular valve - N75- controls the vacuum supply to the pressure unit, which directly acts on the wastegate via a connecting rod. This control system regulates the turbine speed and sets the maximum boost pressure. Special tools and workshop equipment required Multimeter. Wirring Diagram. Scan Tool. Test requirements Fuses OK. Battery voltage OK. Switch OFF all electrical and electronic accessories. Vehicles with automatic transmission, ensure the selector lever position is in "P". Vehicles with automatic transmission, ensure the shifter lever position is in "N" with the parking brake applied. Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 4. Test Procedure Result / Action to Take YES: GO TO: Step 2 ⇒ page 275.				
FusBat	ses OK.	correctne		
• Sw	vitch OFF all electrical and electronic accessories.	NSS Of		
• Vel	Vehicles with automatic transmission, ensure the selector lever position is in "P".			
• Vel	Vehicles with manual transmission, ensure the shifter lever position is in "N" with the parking brake applied.			
Observe all safety precautions: ⇒ "1.1 Safety Precautions", page 2.				
	ew clean working conditions: ⇒ "1.2 Clean Working	1 Condi-		
• Vie	ns", page 4.	ONIO VENTOIT		
 Vie tior Test P 	Procedure Procedure Procedure	Result / Action to Take		
Vie tiorTest PStep	Procedure Procedure Procedure Procedure	Result / Action to Take		
Vie tior Test P Step	Procedure Procedure Procedure Procedure PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16. Was Complaint verified?	Result / Action to Take - YES: ◆ GO TO: Step 2 ⇒ page 275. - NO: ◆ GATHER more information from customer		

Step	Procedure	Result / Action to Take
1	 PERFORM: Preliminary Check to verify the customers complaint. Refer to ⇒ "3.1 Preliminary Check", page 16 Was Complaint verified? 	 YES: GO TO: Step 2 ⇒ page 275 . NO: GATHER more information from customer about the complaint.



	edby	'gu _{ara}
Step	Procedure	Result Action to Take
2	 IGNITION: OFF. DISCONNECT: Wastegate Bypass Regulator Valve - N75- harness connector. CHECK: Wastegate Bypass Regulator Valve - N75- component connector terminals 1 to 2 for resistance. 	 NO: REPLACE: Wastegate Bypass Regulator Valve - N75 Refer to appropriate repair manual.
	 SPECIFIED VALUE: 5 – 25 Ω (@ approx. 20° C). Was Value obtained? 	ttothecor
3	 IGNITION: ON. CHECK Wastegate Bypass Regulator Valve N75- harness connector terminal 1 to ground for voltage. IGNITION: OFF. 	 YES: GO TO: Step 4 ⇒ page 275. NO: PERFORM: Visual Inspection of wiring and component.
	SPECIFIED VALUE: Battery voltage. - Was Value obtained?	 CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 276.
4	 REMOVE: Engine Control Module - J623 Refer to appropriate repair manual. CHECK: Wastegate Bypass Regulator Valve - N75- harness connector terminal 2 to the Engine Control Module - J623- harness connector T60 / 20 for resistance. SPECIFIED VALUE: 0.5 Ω (± 0.3 Ω). Was Value obtained? 	 TES: TIP: The Wastegate Bypass Regulator Valve N75- may fail under loaded operation; please swap a known good Wastegate Bypass Regulator Valve - N75- prior to continuing to the next step. GO TO: Step 5 ⇒ page 276. NO: PERFORM: Visual Inspection of wiring and component. CHECK: Wiring for open, high resistance, short or harness connector for damage, corrosion, loose or broken terminals. REPAIR: Faulty wiring or connector. GO TO: Step 5 ⇒ page 276.

Step	Procedure	Result / Action to Take
5	Final Procedure Perform a road test to verify repair. Does the original DTC return? - Does the original DTC return?	 YES: CHECK: Engine Control Module - J623- harness connector for any damaged, pushed-out pins. REPAIR: As necessary. If all electrical connections are OK: REPLACE: Engine Control Module - J623 Refer to appropriate repair manual. Clear the DTC's. Refer to ⇒ "3.3.4 Diagnostic Mode 04 - Erase DTC Memory", page 24 . Repair is complete. Generate Readiness Code. Refer to ⇒ "3.2 Readiness Code", page 17 . Return vehicle to Customer. NO:
	mmerola	 Perform the diagnostic procedure for any DTC's. If no DTC's return, the repair is complete.
	Wate or commercial P	♦ Return vehicle to customer.
	Wagen AG. Protected by copyright,	SAIO V VOHIBINGO JISAINGO

DAB 9-13-23 FB

Cautions & Warnings

Please read these WARNINGS and CAUTIONS before proceeding with maintenance and repair work. You must answer that you have read and you understand these WARNINGS and CAUTIONS before you will be allowed to view this information.

- If you lack the skills, tools and equipment, or a suitable workshop for any procedure described in this manual, we suggest you leave such repairs to an authorized Volkswagen retailer or other qualified shop. We especially urge you to consult an authorized Volkswagen retailer before beginning repairs on any vehicle that may still be covered wholly or in part by any of the extensive warranties issued by Volkswagen.
- Disconnect the battery negative terminal (ground strap) whenever you work on the fuel system or the electrical system. Do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.
- Volkswagen is constantly improving its vehicles and sometimes these changes, both in parts and specifications, are made applicable to earlier models. Therefore, part numbers listed in this manual are for reference only.
 Always check with your authorized Volkswagen retailer parts department for the latest information.
- Any time the battery has been disconnected on an automatic transmission vehicle, it will be necessary to reestablish Transmission Control Module (TCM) basic settings using the Volkswagen Factory Approved Scan Tool (ST).
- Never work under a lifted vehicle unless it is solidly supported on stands designed for the purpose. Do not
 support a vehicle on cinder blocks, hollow tiles or other props that may crumble under continuous load. Never
 work under a vehicle that is supported solely by a jack. Never work under the vehicle while the engine is
 running.
- For vehicles equipped with an anti-theft radio, be sure of the correct radio activation code before disconnecting the battery or removing the radio. If the wrong code is entered when the power is restored, the radio may lock up and become inoperable, even if the correct code is used in a later attempt.
- If you are going to work under a vehicle on the ground, make sure that the ground is level. Block the wheels to keep the vehicle from rolling. Disconnect the battery negative terminal (ground strap) to prevent others from starting the vehicle while you are under it
- Do not attempt to work on your vehicle if you do not feel well. You increase the danger of injury to yourself and
 others if you are tired, upset or have taken medicine or any other substances that may impair you or keep you
 from being fully alert.
- Never run the engine unless the work area is well ventilated. Carbon monoxide (CO) kills.
- Always observe good workshop practices. Wear goggles when you operate machine tools or work with acid.
 Wear goggles, gloves and other protective clothing whenever the job requires working with harmful substances.
- Tie long hair behind your head. Do not wear a necktie, a scarf, loose clothing, or a necklace when you work near machine tools or running engines. If your hair, clothing or jewelry were to get caught in the machinery, severe injury could result.
- Do not re-use any fasteners that are worn or deformed in normal use. Some fasteners are designed to be used
 only once and are unreliable and may fail if used a second time. This includes, but is not limited to, nuts, bolts,
 washers, circlips and cotter pins. Always follow the recommendations in this manual replace these fasteners
 with new parts where indicated, and any other time it is deemed necessary by inspection.

Cautions & Warnings

- Illuminate the work area adequately but safely. Use a portable safety light for working inside or under the vehicle. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.
- Friction materials such as brake pads and clutch discs may contain asbestos fibers. Do not create dust by grinding, sanding, or by cleaning with compressed air. Avoid breathing asbestos fibers and asbestos dust. Breathing asbestos can cause serious diseases such as asbestosis or cancer, and may result in death.
- Finger rings should be removed so that they cannot cause electrical shorts, get caught in running machinery, or be crushed by heavy parts.
- Before starting a job, make certain that you have all the necessary tools and parts on hand. Read all the
 instructions thoroughly; do not attempt shortcuts. Use tools that are appropriate to the work and use only
 replacement parts meeting Volkswagen specifications. Makeshift tools, parts and procedures will not make good
 repairs.
- Catch draining fuel, oil or brake fluid in suitable containers. Do not use empty food or beverage containers that
 might mislead someone into drinking from them. Store flammable fluids away from fire hazards. Wipe up spills
 at once, but do not store the oily rags, which can ignite and burn spontaneously.
- Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use these tools to tighten fasteners, especially on light alloy parts. Always use a torque wrench to tighten fasteners to the tightening torque listed.
- Keep sparks, lighted matches, and open flame away from the top of the battery. If escaping hydrogen gas is
 ignited, it will ignite gas trapped in the cells and cause the battery to explode.
- Be mindful of the environment and ecology. Before you drain the crankcase, find out the proper way to dispose of the oil. Do not pour oil onto the ground, down a drain, or into a stream, pond, or lake. Consult local ordinances that govern the disposal of wastes.
- The air-conditioning (A/C) system is filled with a chemical refrigerant that is hazardous. The A/C system should be serviced only by trained automotive service technicians using approved refrigerant recovery/recycling equipment, trained in related safety precautions, and familiar with regulations governing the discharging and disposal of automotive chemical refrigerants.
- Before doing any electrical welding on vehicles equipped with anti-lock brakes (ABS), disconnect the battery
 negative terminal (ground strap) and the ABS control module connector.
- Do not expose any part of the A/C system to high temperatures such as open flame. Excessive heat will increase system pressure and may cause the system to burst.
- When boost-charging the battery, first remove the fuses for the Engine Control Module (ECM), the Transmission Control Module (TCM), the ABS control module, and the trip computer. In cases where one or more of these components is not separately fused, disconnect the control module connector(s).
- Some of the vehicles covered by this manual are equipped with a supplemental restraint system (SRS), that
 automatically deploys an airbag in the event of a frontal impact. The airbag is operated by an explosive device.
 Handled improperly or without adequate safeguards, it can be accidentally activated and cause serious personal
 injury. To guard against personal injury or airbag system failure, only trained Volkswagen Service technicians
 should test, disassemble or service the airbag system.

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Cautions & Warnings

- Do not quick-charge the battery (for boost starting) for longer than one minute, and do not exceed 16.5 volts at the battery with the boosting cables attached. Wait at least one minute before boosting the battery a second time.
- Never use a test light to conduct electrical tests of the airbag system. The system must only be tested by trained Volkswagen Service technicians using the Volkswagen Factory Approved Scan Tool (ST) or an approved equivalent. The airbag unit must never be electrically tested while it is not installed in the vehicle.
- Some aerosol tire inflators are highly flammable. Be extremely cautious when repairing a tire that may have been inflated using an aerosol tire inflator. Keep sparks, open flame or other sources of ignition away from the tire repair area. Inflate and deflate the tire at least four times before breaking the bead from the rim. Completely remove the tire from the rim before attempting any repair.
- When driving or riding in an airbag-equipped vehicle, never hold test equipment in your hands or lap while the vehicle is in motion. Objects between you and the airbag can increase the risk of injury in an accident.

